# CB Action

AUSTRALIA'S ONLY CB MAGAZINE

January/February 1993 $3.75

AUSTRALIAN PUBLICATION

# Win A CELLULAR PHONE LOOK-ALIKE CB!

## REVIEWS

- AOR's Brilliant New Scanner
- GME's New 27MHz Handheld
- BBC World Service Receiver
- TX-800 'Phone CB

## FEATURES

CB/Amateur Rigs —Compared

Heaps of Scanner Freqs

Get Your Own Simplex Repeater

**Plus** our usual sections on shortwave, scanning, radio related computer programmes, HF utilities, book reviews—and a whole lot more.

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Icom's impressive range of receivers lets you listen to more frequencies, across the band and around the world.

Starting with one of the smallest receivers ever produced, the IC-R1 covers 100kHz - 1300MHz (2 ~ 905MHz guaranteed), with AM, FM and Wide FM modes, Dual Frequency Selection and 100 memories.

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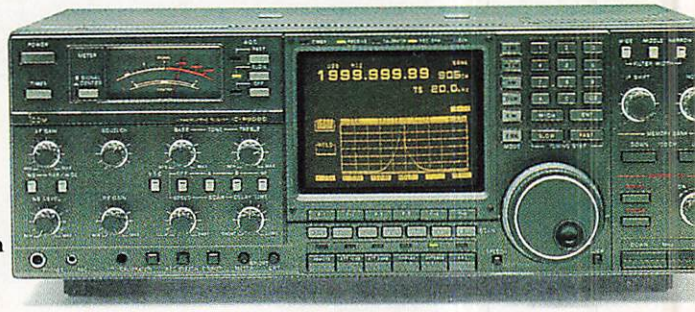

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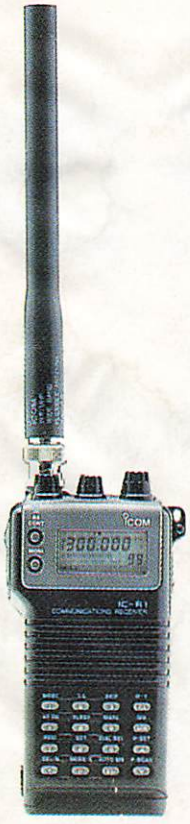
So tune in to the ones that professional listeners use, from the wide range of Icom wide band receivers.

IC-R7100

IC-R100

IC-R72



IC-R1

**For further information call free on (008) 338 915**
**or write to Reply Paid 1009 Icom Australia Pty Ltd**
**P. O. Box 1162 Windsor Victoria 3181**
**Telephone (03) 529 7582 A.C.N. 006 092 575**

*ICOM Australia's warranty is only applicable to products purchased from their authorised Australian Dealers.*

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**WIN WIN WIN**
**Try our crossword (page 65) and win a GME-Electrophone TX850 CB-Phone Look-alike!**

***The March/April issue will be on sale 23 February***

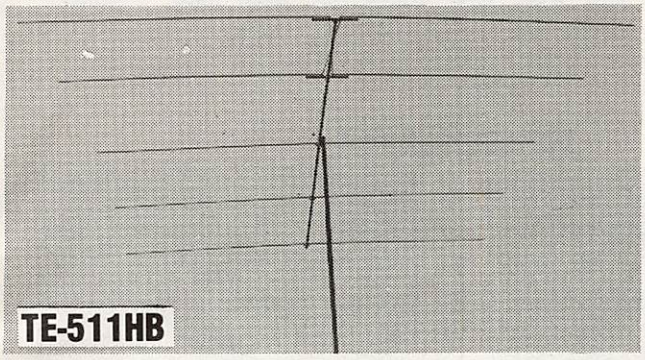
# TET-Emtron ANTENNA SYSTEMS

## MADE IN AUSTRALIA FROM BEST MATERIALS AND AT BEST PRICES

## NEW "DUAL DRIVE" 3 & 5 ELEMENT BEAM ANTENNAS

**This dual drive system uses a special feed arrangement which feeds the reflector and radiator elements. This method produces a wider frequency coverage (see SWR CURVE), higher gain and excellent F/B RATIO which is roughly comparable to adding an additional element to a conventional BEAM DESIGN.**

**The performance of this new system exceeds even conventional YAGI-UDA DESIGN. TET-EMTRON ANTENNAS ARE MADE ONLY OF HIGH GRADE ALUMINIUM AND STAINLESS STEEL HARDWARE.**

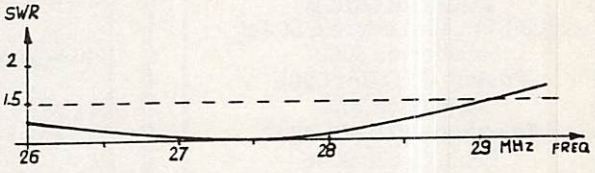



The "CB SUPER BEAM" TE-511HB DUAL DRIVE BEAM FOR THE DX-CONNOISSEURS IS HERE. COMPARE IT WITH ANY OTHER SIMILAR ANTENNA.

**SPECIFICATIONS:**

| | | | |
|---|---|---|---|
| BAND | 26 to 29 MHz | GAIN | MIN. 10dBi/7.8dBd |
| F/B RATIO | 25 dB | POWER | 2 KW |
| BOOM LENGTH | 5 M | MAX. ELE. LENGTH | 5.3 M |

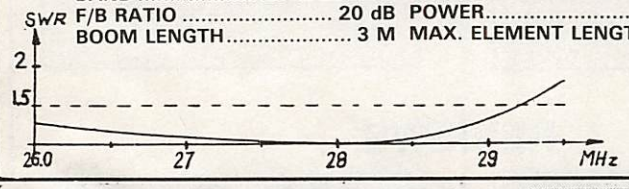
**ONLY $ 259**



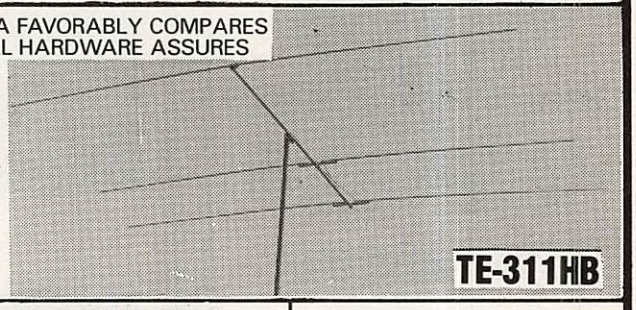

THIS NEW TET-EMTRON 3 ELEMENT DUAL DRIVE TE-311HB ANTENNA FAVORABLY COMPARES WITH 4 ELEMENT BEAMS. ITS ALL ALUMINIUM AND STAINLESS STEEL HARDWARE ASSURES LONG LIFE AND RELIABILITY.

**SPECIFICATIONS:**

| | | | |
|---|---|---|---|
| BAND | 26 to 29 MHz | GAIN | MIN 8.5 dBi/6.3 dBd |
| F/B RATIO | 20 dB | POWER | 2 KW |
| BOOM LENGTH | 3 M | MAX. ELEMENT LENGTH | 5.3 M |




**ONLY $ 159**




## AOR AR-3000A

NSW Government Contract No. 870/91

### PROFESSIONAL RECEIVER FOR MONITORING & SURVEILLANCE

Features —

- ★ 100 KHz — 2.036 GHz continuous operation
- ★ Modes — AM, SSB, NBFM, WBFM, CW, DSB, AFSK, RTTY
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- ★ Priority Channels 4 — Programmable interval
- ★ Scanning Speed — 50 channels per second
- ★ Tuning Rate - Variable from 50 Hz
- ★ Improved Sensitivity — 0.25 uV (2.5 MHz to 1.8 GHz)
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- ★ Large LCD Display
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- ★ Superb Performances — 15 Band Pass Filters & GaAs FET RF Amplifiers
- ★ Programmable Pause Scan
- ★ State-of-the-Art Technology
- ★ Software for Computer Control

**ONLY $1599**

## AOR AR 1500 1000CH

Includes SSB, AM, NBFM, WBFM. Frequency coverage 500 khz-1.3GHz **ONLY $699**

### SUPERB NEW H.F. RECEIVER

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**Outstanding Performer!!**

**BRIEF SPECIFICATION**

Frequency coverage: 30 kHz to 30MHz; Modes: USB, LSB, AM, CW, NFM, Synchronous AM (ECSS), (LSB/USB/DSB); IF bandwidths: 2.2, 4, 7, 10, 12; Display: 5 digit LCD; Tuning Steps: 8Hz; Master oscillators: Quartz Crystal; Receiver type: Double Conversion; Memories: 30 each holding frequency and mode; Aerial inputs: 600 ohm long wire, 50 ohm coaxial feed, Hi-Z whip; Power supply: 12Vdc from mains adaptor (supplied) External 12Vdc source; Loudspeaker: Internal, External Connections; Headphones, Ext. Loudspeaker, Record Output; Construction: All metal light alloy case. Metal panels; Size: 253 x 109 x 204 mm; Weight: 1.9 kg

**Write for full specifications**

**ONLY $1425**

## KENPRO Rotators

New shipment landing soon.

### ACCESSORIES

| | | |
|---|---|---|
| ★ Co-ax Cable | RG58 | $1.00 pm |
| | RG213 | $3.00 pm |
| ★ Meters | Revex W560 1.6-525 MHz | POA |
| | Revex W570 1.6-1300MHz | POA |
| | EMTRON EP2000 1.6-60MHz | $125 |
| ★ Co-ax Seal | | $5.00 per roll |
| ★ Co-ax Switches | 2 position | $39.00 |
| | 4 position | $99.00 |
| ★ Scanning Antennas — base | DIAMOND D130 Discone | $199 |
| | DIAMOND D707 Active | $299 |
| ★ Base Antennas | Vertical 27 MHz | from $65.000 |
| ★ Base Antennas — | Vertical UHF | from $79.00 |

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# ON CHANNEL

*The media releases are out, the memos have been written, the regulations are almost in place -- but there's quite an iceberg under that tip.*

*The WIA has not traditionally been a body to eagerly embrace change, let alone any change as major as that of the Limited Novice licence.*

*Amateurs both within and without the WIA have for years lobbied for the introduction of what we now have in the LN class.*

*Calls for a digital-privileged VHF/UHF licence were being heard in the mid-1980s with a far-sighted submission by respected hams Roger Harrison and Jim Linton. The push for a code-free "communicator" licence can be traced back to the mid-70s. Yet until recently the WIA vehemently opposed VHF privileges for novices and totally rejected claims for no-code access to HF.*

*It clung to the notion of an incentive-based licence structure whereby novices (read "apprentices") slowly learned their craft and climbed up the ladder to become masters (full-calls), rather than embracing a model which recognised that the sheer diversity of amateur radio means it will always be different things to different people... and that all hams don't want to become full-calls any more than everyone who drives a car wants to race at Bathurst.*

*So why the change?*

*No noble reason, no strategy or vision to carve amateur radio a new place in the world. It was just that strongest of all instincts -- self-preservation.*

*The amateur radio service needs new blood, has needed new blood since the 1970s, when the CB boom led thousands of newcomers into the newly-created novice licence grade. Without the numbers, the WIA's claims on valued chunks of radio spectrum were becoming very thin.*

*Nowhere was this more evident than on UHF, with commercial interests squeezing the 420-450 MHz band from both sides. With the spectrum being increasingly treated as a "demand-oriented" resource, how could a few thousand hams justify their stranglehold on prime radio real estate?*

*This was one of the hidden but very real motivations behind the decision to allow novice amateurs access to the two metre VHF band some years back. Yes, it gave a helping hand to the industry.*

*Sure, it attracted newcomers (who didn't as much want DX as they wanted to talk to other locals of like mind, so they really sought an amateur version of UHF CB -- something the WIA would be loath to admit).*

*But behind this, the WIA hoped that the novice influx onto 2m -- previously the exclusive domain of limited and full-call licence-holders -- would push these higher grades up onto 70cm, populating an under-utilised and under-appreciated band in danger of being lost to commercial interests.*

*Similar reasons are behind the new LN class.*

*The new blood is needed fast, and the best way to do this is to tap into advanced computer-based digital modes like packet radio. And because the pressure is still on 70cm, that's also where the LNs are headed.*

*Likewise, the industry wanted a leg-up. For several years the hottest items in the ham shops have been the dual-band mobiles and handhelds.*

*They are practical and affordable. It is almost as if they were designed with the Limited Novice in mind -- in truth, it's the other way around.*

*And of course, new hams need to study and sit for exams. It is highly likely they will be drawn into study classes run by the clubs, and unavoidably they will attend the exam sessions run by the WIA.*

*In a very real sense, it appears that this time around everyone has won.*

## IN THIS ISSUE

*With the above in mind, check out the "no-code" debate which starts on page 41 - it's worth a laugh or two. Also, if you think your HF CB is good, read Chris Edmondson's CB versus Amateur rig piece and wonder at how a rig can cost $10,000! There's a one pager about getting your own 'simplex repeater' - but read the small print carefully to avoid DoTaC trouble.*

*Russell Bryant has a rave review of the new AOR scanner and there's a whole lot more.*

*...and that's about it for 1992. Our thanks to all our readers, contributors and advertisers. Have a great Christmas and an even better 1993. We have a number of new features lined up which we hope to kick off with in the next issue - don't miss it.*


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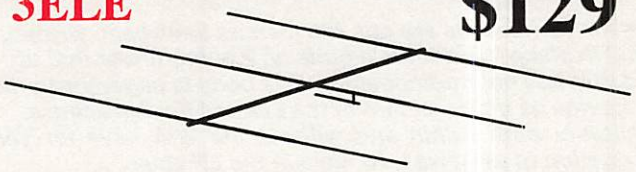
# MOBILE ONE COMMUNICATIONS SYSTEMS Summertime is antenna

**3ELE Base station directional beam antenna**

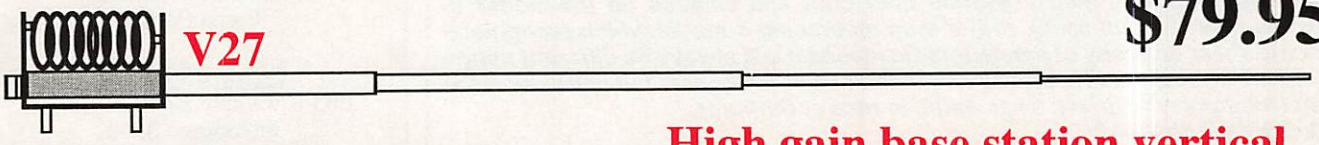
The 3ELE Yagi antenna is a 7dB high gain three element directional array for 27 MHz Citizens Band Radio. All antenna lengths and spacing measurements are factory pre-set for optimum gain and can be easily assembled in a few minutes with a screwdriver and spanner for superior DX communications. The gamma match feed can be tuned simply by adjusting the length of the gamma rod and is terminated with a weather-proofed SO239 jack for PL259 connection. The design and aluminium construction of the 3ELE has been proven over 15 years by hundreds of enthusiasts. Comes complete with bracket and hardware to suit a 2" mast. Use the 3ELE beam antenna this summer to work long distance while there is still a few sunspots out there. Other companies just can't match this one for value and performance. Backed up by our five year "No worries warranty".

3ELE



**$129**

## 3 Element Yagi beam antenna



V27

**$79.95**

## High gain base station vertical

**V27 5.7m Omni-directional high gain base antenna**

The V27 1/2 wave vertical base antenna produces a powerful 2dB gain that packs a real wallop for communications on the crowded citizens band. It is ground independent, which means there are no clumsy radials to assemble, but unlike other ground independent antennas, the V27 can be easily adjusted for other close frequencies if needed i.e.. marine. The aluminium sections have factory pre-set assembly holes for error free assembly and comes complete with mounting clamps to suit a 2" mast. Thousands of users over 15 years have proved this design to be a winner. You'll be a winner too with the five year "No worries warranty".

With SAM base, cable & connectors **$149.95**

## Super Spring Skipwhip

**DX270SAMPK 1.8m Skipwhip Heavy-duty off-road antenna kit**

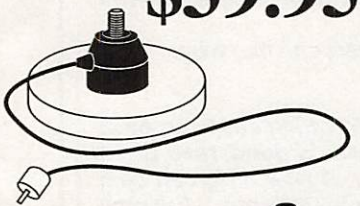
If you have the need for a rugged antenna that wont let you down when the going gets tough then don't look any further than the Super Spring Skipwhip. It is available in a complete kit form that contains the heavy-duty injection moulded 1/2" threaded Super Antenna Mount, cable and connectors. The heavy-duty spring is an integral part of the whip and provides protection from vibration and impact. The antenna is constructed on a solid tapered fibreglass former and wound with virtually indestructible 1/4" braided copper to withstand the wear and tear of off-road driving. The Skipwhip is finished in a rugged ultra-violet secure polyolefin heat shrink to ensure that it is absolutely the best value for money antenna available. The Skipwhip will still be performing long after the five year "No worries warranty" has lapsed.

**BASE 'UL' VHF & UHF Base and cable assembly**

The patented 5/16" threaded antenna mount BASEUL is a low profile base easily installed into gutter and boot mounts or directly to the vehicle for light weight antennas of HF, VHF & UHF frequencies. The base can be coaxially terminated for use on frequencies above 100 MHz. Complete assemblies are available that includes 3.6 mtrs RG58c/u coaxial cable and PL259 UHF connector. Perfect for permanent UHF and scanning installations.

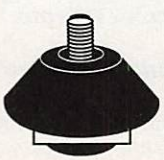
## Magnetic mount

**$39.95**



**$8.95** base only

**$16.95** base, coax & connector



## UHF Base mount

**MAG12C Magnetic mount for HF, VHF & UHF mobile antennas**

One thing that scanning enthusiasts have in common is that they take their scanners with them where ever they go. With the MAG12C magnetic mounting system you can easily mount one of our 5/16" threaded Scanning antennas for clearer outdoor reception while travelling in your vehicle. When you arrive at your destination the magnet can be instantly removed and locked in the boot or taken indoors with you for better reception than the floppy antenna supplied with the scanner. The enhanced field core of the magnet provides superior adhesion to steel surfaces than other imported products. Comes complete with 3.6 mtrs RG58c/u coaxial cable and PL259 UHF connector.

* Prices quoted are recommended retail prices

**Mobile One products are available at Dick Smith Electronic**
**For further details call 046 556677 fax 046 556600 or write**

# time . . .

## Hand transceiving & scanning antenna

**$26.95**

**BNCHW High gain UHF HT antenna**

With scanners becoming smaller and more portable these days you need big performance from small antennas. The BNCHW is a half wave ground independent antenna for 477MHz that pushes a whopping 2dB gain guaranteed to outperform other Hand-held Transceiver antennas and pull in signals right across the UHF band better than anything that came with your scanner. Try it, you'll like it and of cause its backed up with our five year "No worries warranty".

## Mobile scanning antenna $14.95

**SCA 60 cm Mobile Scantenna**

The Scantenna is our most copied scanning antenna of the range. They say that imitation is the sincerest form of flattery. Well thank you everyone. There may be many imitations, but only the Scantenna is so well constructed that we'll back it with our five year "No worries warranty". It is covered in white heat shrink to alleviate any confusion with our transmitting antenna range and has now become the "Standard" for mobile scanning. Independent tests have proved its effectiveness over the popular scanning frequencies of the modern wide band receivers. Mobile mounting is a snack with the 5/16" threaded UHF base and coax kit (UL12C) or the magnet and dipole mount kit (MAG12C).

## Transcanning antenna $29.95

**SCATX 100 cm Bandspanner transcanning antenna**

Introducing the Bandspanner. The antenna to compliment today's wide band scanning transceivers. This is the antenna that is all things to all radios. It transmits on the air band, low band VHF, UHF commercial & CB bands and provides greater range performance than other mobile scanning antennas. The 27 MHz to 1300 MHz receive range is obtained by incorporating a wide band UHF whip and adding helical traps for the lower frequencies. Mount it mobile on a magnet or our 5/16" threaded UHF base and coax assembly for trouble free performance well beyond the five year "No worries warranty". Read more about this antenna in this months scanning antenna review in this magazine.

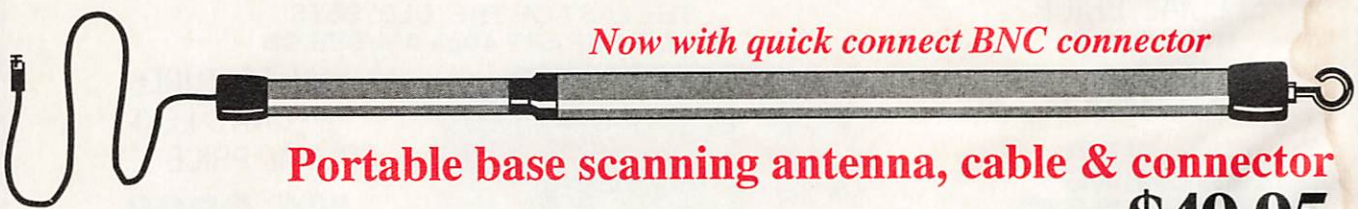
## High gain UHF mobile & scanning

**$49.95**

**M476 1.2 mtr Megablaster 6dB UHF CB & Scanning antenna**

The Megablaster is a 6dB multiple vertical array for 477MHz UHF citizens band that exhibits excellent scanning characteristics as well. Originally designed for high gain performance on the UHF band, the Megablaster has been used with excellent results for scanning the VHF & UHF bands. This rugged UHF antenna is constructed with braided copper over a fibreglass former and coated with ultra-violet safe poleolefin heat shrink. Mounts to our standard 5/16" UHF base and will stay there trouble free for a guaranteed five years with our "No worries warranty".

*Now with quick connect BNC connector*



## Portable base scanning antenna, cable & connector

**$49.95**

**SCBASE Portable scanning base antenna**

The SCBASE just keeps on getting better. This antenna is perfect for the scanning enthusiast on the run. Especially suitable for today's wide band scanners the SCBASE can be hung on a hook indoors or lowered from the window and connected up for instant reception in areas difficult to install permanent antennas. The antenna is actually a number of dipoles for various frequencies bundled into a neat PVC package and fed with 3.6 mtrs of RG58 coaxial cable. The SCBASE antenna is now being supplied with BNC connectors that plug straight into most modern wide band scanners. Read more about this portable base antenna in this months scanning antenna review in this magazine. Don't forget that only Mobile One backs up their scanning antennas with the five year "No worries warranty".

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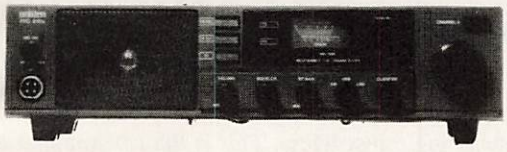

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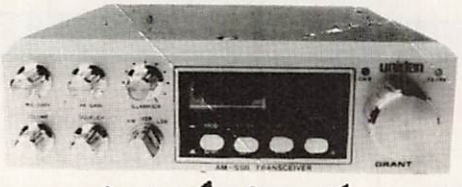

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# Newcomers Start Here

***It should be stated right now that there is no special CB language.***

Many newcomers believe that they require a lecture on the basics of CB language before they can operate on air. This is simply incorrect. While some stations use esoteric CB jargon, all Australian CBers understand English and this is all you need to go on air.

A half hour spent listening before going on air for the first time will be time well spent as you will hear how to initiate a contact and how pass the conversation back to the other station and, really, that's about all there is to it.

Even so, while it is not essential that you know and understand some of the various abbreviations used and/or the amateur 'Q' code, it can be helpful to you.

That is what this introduction is all about. One of the first things you will hear is a ***QSO.***

A ***QSO*** is simply a contact with another station.It derives from the amateur radio operator's ***'Q' code*** - a form of abbreviation used by amateurs when sending ***CW*** (continuous wave transmission) which is simply another way of saying morse code.

***Morse code*** is not used in CB, however, a number of 'Q' code abbreviations are ...

A ***QSL*** is a card sent from one station to another confirming that these stations have been in radio contact. It is not sent after every contact, but, is usually exchanged after a DX contact. ***DX*** means long distance, usually overseas but often just interstate. If the station to which you are talking asks whether you QSL the operator is asking whether you will send him a QSL card to confirm the contact.

A ***QTH*** is the 'Q' code for location so, if you're asked ***"what's your QTH?",*** the station is asking where your station is located. It's just as easy to ask in plain English, but, it adds a bit of glamour if you say QTH instead.

You'll hear many stations talking about ***SWR (usually pronounces swer - which is incorrect - it is SWR spoken as letters) and this stands for S***tanding ***W***ave ***R***atio. This is essentially a measure of the antenna's effectiveness and is read off an ***SWR meter.*** You will learn what SWR is from this magazine or from a CB store. When you hear a station calling ***CQ CQ*** it means that he is looking for a contact with another station. CQ means ***'seek you'*** while CQDX CQDX is different (seek you long distance) in that the station only wants a long distance contact - not a local one.

***AM*** stands for amplitude modulation while ***SSB*** stands for single sideband. If you have an ***AM only rig*** it's nice for everyone if you stay on the lower channels and, conversely, if you are using SSB you should restrict your activity to the upper channels.

***QSB*** means that the signal has a tendency to fade - that is, it goes from strong to weak and back to strong again, sometimes over a period of seconds and other times over a period of minutes.

It is not a fault of the station, but, of atmospheric conditions. If a station says there is QSB on your signal it means that your signal is fading and when this occurs it is best to keep your ***OVER*** short or you are likely to lose the other station while you're talking.

***SKIP*** is essentially the same as DX - if the skip 'is running' it means that there are interstate and/or overseas stations being heard.

***BEAM, YAGI and ARRAY*** all mean much the same. They mean that the station is using an antenna system which effectively (and legally) increases the restricted power output of the CB rig and can be pointed at the other station for improved communication.

A ***ROTATOR*** is used to turn a beam, ***Yagi*** or array. Incidentally, ***Yagi*** is spelt with a capital Y as Yagi is the name of the inventor of the beam.

***LINEAR, BOOTS, AFTER-BURNER, LITTLE HELPER,*** etc mean that the station is using illegal equipment to increase the power output and will eventually receive a call from DoTac. ***DoTaC*** is used in this magazine as an abbreviation for the Department of Transport and Communications - the authority charged with the regulations of CB radio.

A ***POWER MIKE*** is an after-market accessory which can also improve your station's 'talk power'. Whether or not they are legal is open to question, but, they probably aren't.

***QRM*** is when another station is making it difficult to hear due to being too close to your own station, having a rig in poor condition, running illegal power, etc. ***QRN,*** however, is noise made by atmospheric conditions or, more likely, static caused by poorly installed electrical power lines out in the street.

A ***SWL*** is a ***S***hort ***W***ave ***L***istener but an ***XYL*** is usually the wife - an ex-young lady. ***YL*** is of course young lady and a ***DOUBLE BUBBLE*** is a police vehicle. ***GOOD BUDDY*** is a somewhat derogatory term applied to operators who still use American style CB jargon such as, "what's your 10-20?" or "that's a big 10-4".

This ***10 code*** originated in America, but, is now rarely used as it indicates that the operator has what can be best termed a 'juvenile brain'.

A ***BREAKER*** is an operator who wants to get into an existing conversation and there's nothing wrong with ***BREAKING*** providing that you only call in the pause between overs.

If you break between overs one of the stations will probably say ***ACKNOWLEDGE THE BREAKER*** which means that you have been heard and will be invited to join in when the stations are ready - in other words standby and don't keep shouting.

An ***ALLIGATOR*** is another derogatory name which is applied to an operator who talks too much but doesn't listen - in short, all mouth and no ears. ***SANDBAGGING*** means to listen to a conversation but not join in yourself.

A ***DUMMY LOAD*** is a device which should be used when testing or tuning your rig. It can be purchased from any CB store and should be a must in your list of station equipment.

***UHF*** stands for ***U***ltra ***H***igh ***F***requency and is the 477 MHz CB service.

***LONGPATH*** means that you are pointing away from a station you are speaking with rather than ***SHORTPATH*** which of course means the opposite.

Different atmospheric conditions mean that at certain times you can communicate with (usually overseas) stations by sending your signal right around the world rather than by the most direct path. An operator who works out of the legal channel frequencies or runs illegal equipment is referred to as a ***PIRATE.***

An ***ATU*** stands fro an ***A***ntenna ***T***uning ***U***nit which is used to tune your antenna to a good match with your rig if the SWR is a little too high. It won't cure any major SWR problems, but, it can adjust a slightly high SWR reading to a 1:1 match with the transceiver. If you receive a visit from the ***RIs*** you're probably in trouble for causing ***TVI*** - ***T***elevision ***I***nterference - or - ***BCI*** - ***B***roadcast ***I***nterference. RI stands for ***Radio Inspector*** - the gentlemen from DoTaC who call around if there are any complaints about your station. RIs are also often called ***RED INDIANS. COAX*** stands for coaxial cable, the link between your rig and the antenna while a ***WHIP*** is not something wielded by a leather-clad lady but is rather a generic tern for mobile antennae.

A ***REPEATER*** relays a UHF CB signal from one point to another so giving much greater range of communication and a repeater list is published in every second issue of this magazine. After all of the above we reiterate - it is not necessary to learn CB jargon to go on air. Sure it helps, but, it will all come in time - for now though just use commonsense English and if you don't understand something don't be afraid to ask - remember everyone you hear also had a first time on air.

**We hope you enjoy CB and CB Action.**

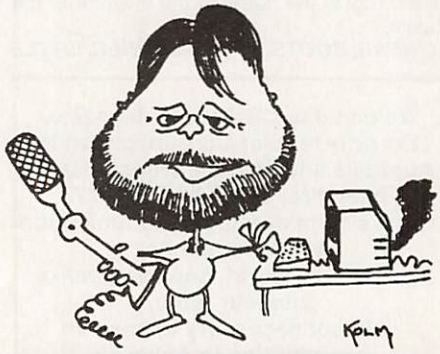
---

**Welcome to CB Action magazine - the only regular CB publication in Australia and also the oldest, having been first published in 1977.**
**CB is a form of radio communication which is popular around the world, however, unlike amateur radio, it is not necessary to pass an examination to go on air.**
**All that is needed is a licence and the equipment.**
**CB Action, though, is a little more than just CB. While CB is the backbone of the magazine, it also has reports and reviews on scanners, antennas, shortwave radios and other areas of general interest to radio communicators and listeners.**
**In the course of reading the magazine (and on air) it is probable that newcomers will encounter words which mean nothing to them.**
**This short introduction is to help these readers understand CB terminology and its application.**

---

# HF TRANSCEIVERS Comparing CB rigs to amateur transceivers

**To some CB operators, the idea of comparing the average CB radio to an amateur transceiver would be something like comparing a cellular telephone to a Star Trek communicator. But are the two all that far removed? Is it possible to put a CB rig at one end of the bench and an amateur rig at the other end and draw sensible comparisons? We decided to find out...**



**By Chris Edmondson, VK3CE Editor, Amateur Radio Action**

I remember the first time I saw a commercially-made amateur radio transceiver. As I recall, I was just seven years old and I was taking part in the very first Jamboree on the Air, where Scouts and Guides (and Cubs, in my case) from around the world hook up with each other via the medium of amateur radio. I remember the excitement of hooking up with other groups in the same state and, later, with another group on the other side of the country. Funny thing is, while all the other kids were dreadfully mic-shy, they couldn't keep me off the thing! That was thirty-something years ago... and I was absolutely hooked for life.

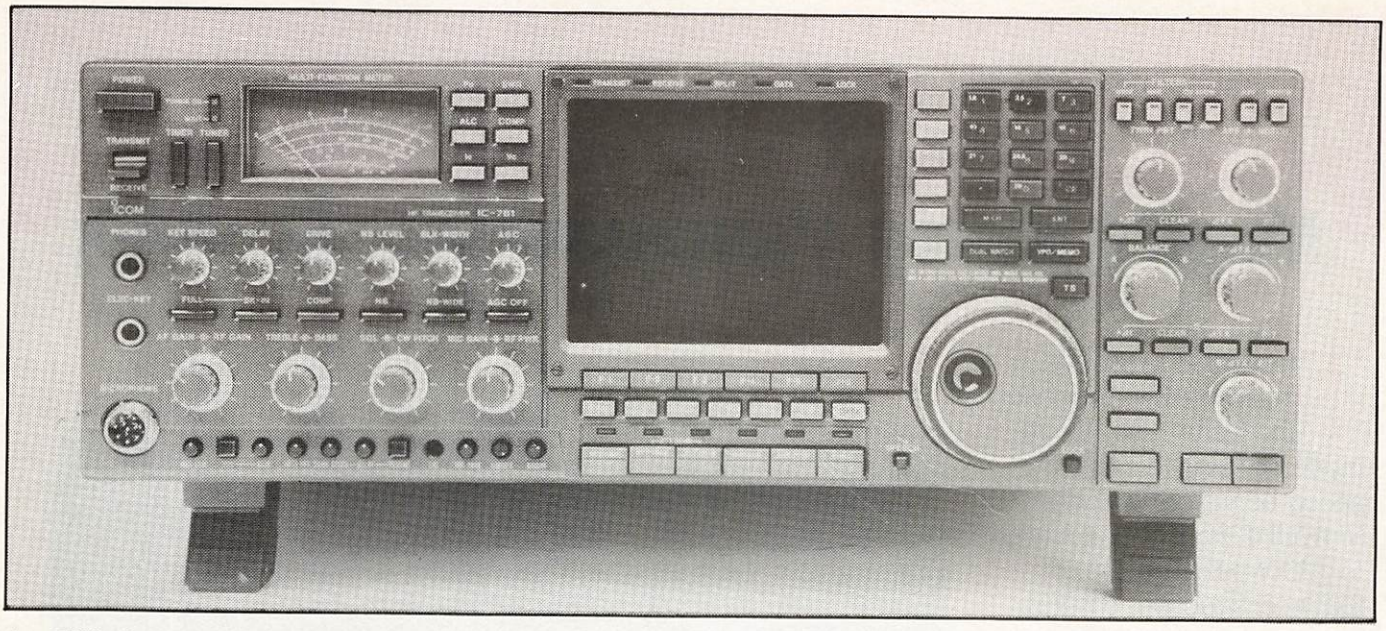
Gee, that radio was an impressive thing. To a young, impressionable kid it was a thing to wonder at. It was American, it was huge, and it had a name almost as fancy as the carefully-polished chrome knobs and dials. The microphone looked something like a candlestick telephone, and it, too, was chromed all over. I'd probably see it in a more reasoned light now (grey baked enamel and bakelite knobs!) but to me it was just the most fabulous thing I'd ever seen.All those fantastic knobs! It must have been able to anything, I enthused. These days, of course, I know better. Those extra dials and knobs are sometimes put on a radio simply to make it look more impressive, without necessarily improving its functionality. Perhaps that's a bit like putting a turbo boost gauge on a turbo-charged car - it goes just as well without the gauge! Other extra controls have a range of important functions, and we'll take a quick look at some of them later in this article.Manufacturers pull all sorts of sneaky tricks to make you want their product instead of somebody else's. One astonishing trick I remember was pulled by a respected hi-fi company - it took its $299 CD deck, ripped off the case, and put the complete - unaltered - circuit and mechanicals into a larger case. Electronically, you'd really have been hunting to find a single difference between the two, but because the 'new' deck was almost twice the size and had prettier switches and styling, it cost a rather cheeky $499 - that's a whopping 66 per cent up on its virtually-identical brother! (Anyway, can you really tell the difference between a cheap CD deck and an expensive one if you have an 'average' amplifier and speakers? But we digress...)

## Enter the computer...

Many modern transceivers have a CPU to control everything beyond their most fundamental functions. This 'central processing unit' can be as basic as a simple 'yes/no' IC or as advanced as a specially-made, mask-programmed microprocessor. In other words, a all-out computer.

In these so-called 'intelligent' radios, then, anything more esoteric than the most basic of commands is dealt with by the unit's electronic brain. Purely physical things, like turning the volume up, or adjusting the squelch, generally don't involve

***Uniden Grant is a 'classic' CB transceiver, however, when compared to a good amateur rig - well, there is really just no comparison.***



***The Icom IC-781 is arguably the 'top of the line' amateur transceiver. With a power output of 150 watts, auto antenna tuning, 'video' screen which performs a multitude of tasks and an enormous number of features, this rig costs as much as a small car - somewhere between $9,000 and $10,000, but, rigs costing as little as $1,500 (Yaesu FT-757 GXII) also do a fine job.***

the CPU - but even these functions are electronic on some radios!

The expensive part of the CPU these days lies not in its manufacture but in its programming - ie working out what features to implement and then working out how to put them there.

The modern radio's computer controls all manner of things, from tuning steps and range to odd-ball things like TOT. Like what? Ten points if you said Time Out Timer, a function which turns the transmitter off if the PTT is kept depressed more longer than a predetermined time. No kidding. It's mandatory on all commercial radios, but isn't common on either CB or amateur sets.

Okay, let's take a look at the basic things....

## Volume control.

Yup, every CB set has one of these. Most of the rigs on today's market use the good old potentiometer (generally sensibly abbreviated to 'pot'), although a few use tacky 'up-down' buttons to add a little needless confusion.

## Squelch.

Here's another of the basic controls. As we all know, this thing is a good way to avoid headaches when using FM on UHF, but is rarely used by those 'in the know' on HF when using modes such as single sideband (SSB). Sadly, I've seen a few rigs fitted with those silly 'up-down' buttons for squelch, too, while a few completely unmentionable radios actually remove the knob from the front panel and put a pre-set control inside the box! Yuk. To my way of thinking, a radio like this is one generally well worth avoiding.

In fact, the squelch is such an important part of working on FM that its control is often as large as the volume control on even a really small hand-held transceiver - and that's rarely the case on a professional HF transceiver!

In what is probably amateur radio's biggest departure from the channelised CB service is its 'choose your frequency' nature, in which the band edges are clearly defined and between which you are free to roam at will. The original method for this was to 'swing' the oscillating frequency of a quartz crystal in a variable crystal oscillator or VXO, which allowed the transmitter's frequency to move by a reasonable amount either side of the fundamental frequency.

Later transmitters incorporated a variable frequency oscillator, or VFO, which allowed a far wider range of frequencies to be tuned, using a very similar mechanism to (although somewhat more sophisticated than) the tuning arrangement in a manually-tuned (turn the knob) broadcast receiver.

The modern approach is fully-electronic, with no moving parts to compromise reliability (they cost more, anyway!). This circuit relies on a phase-locked loop, or PLL, to control the tuning, and this is generally (though not always) mated to an electronic display of frequency or channel number.

So there's the first major variation: a CB set has 40 preset channels which the user may not vary, whereas an amateur rig has a tuning mechanism of some sort and free tuning across a band or bands.

Another major difference, of course, is the number of bands allocated to each service. The CB service has 80 channels across two bands. If all the frequency ranges a full-call amateur is allowed to operate on were to be channelised, there would be millions of channels. While that sounds as though amateurs are very greedy, the truth of the matter is that many different transmission modes are employed by amateurs, and some of these (television, for example) take as much bandwidth as several hundred voice channels, or even more.

The other major point to be made where the number or size of bands is concerned is that the amateur service is encouraged to send its signals over very large distances - right around the world - and different frequency bands are needed to cope with changing propagation conditions caused by solar radiation and the rotation of the earth.

The amateur has access to many bands, but the exact details vary from country to country. In Australia, radio amateurs are permitted to use one MF band, eight HF bands, two VHF bands, three UHF bands and seven SHF - Super High Frequency - bands.

Only some of these bands - those up to 23cm - are served by commercially-made equipment; the rest rely on the amateur making his or her own gear for the band in question. This is yet another area in which the two services differ: the amateurs are free to use whatever equipment they please (provided the regulated power limits and bandwidths are observed, of course) but the CB operator may only use type-approved (by DoTC) CB equipment.

***(Continued over page...)***

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# HF TRANSCEIVERS Comparing CB Rigs to Amateur Transceivers

*(continued from page 11)*

Modified commercial transceivers may well surpass the requirements of the CBRS but are, nonetheless, illegal.

## The front panel...

The front panel of the typical amateur transceiver (particularly an HF one!) is likely to be very different to that of the typical CBRS HF rig. To start with, you'll find there's a lot more controls, and some of them won't mean much to you the first time you see them.

The largest knob invariably belongs to the VFO. (Actually, although these knobs turned large ganged capacitors in years gone by, thereby tuning the VFO, modern rigs don't have a VFO as such, with optical choppers incrementing or decrementing digital counters which step the PLL one unit up or down. It may have lost some of the romance, but it works a helluva lot better!) On some amateur rigs the VFO knob is sometimes up to 75mm or even more in diameter, while other controls are usually quite small. An amateur may spend a lot of time slowly turning this knob, listening intently for any sign of a weak signal from the other side of the globe.

## The receiver...

Sometimes you can listen too closely. The sensitivity of the receiver determines how weak a signal you can hear, and the more expensive transceivers are fitted with extra controls to get the best advantage from a receiver's design. Some radios are able to reproduce a signal with quite good readability while other radios connected to the same antenna may produce hard-to-read, weak copy. However, while it's all very well to be able to hear very weak signals, a very strong signal will tend to 'swamp' or overload a receiver unless it is fitted with additional controls to vary the amount of signal it is able to hear. A sudden local signal on AM or SSB when your receiver has everything running flat chat can blow you into next week. (There's a clear advantage of FM: weak signals should have the same 'loudness' through the speaker, whereas the volume of AM/SSB signals varies in direct proportion to the strength of the signal.)

The sensitivity controls are usually called: RF Gain, a variable control which progressively increases the strength of signal necessary for anything to be heard in the speaker.

## Pre-amp/atten controls.

The pre-amplifier amplifies all signals going into the first stage of the receiver, making everything louder. In other words, a pre-amp also amplifies noise, both man-made and of natural origins. As the amplifier also introduces a little noise of its own it's a good idea to use this control pretty judiciously. I'd suggest that you would want to use it only on a quiet band, and preferably one above 10MHz.

The attenuator is the opposite of an amplifier. This control attenuates, or reduces, the amount of signal (and noise) entering the first stage of the receiver, meaning overload can generally be avoided from strong stations.

## Other receiver controls...

Closely tied up with the sensitivity controls are those for selectivity, noise blanking and the automatic gain control (AGC). There are quite a few controls grouped under this heading, but we've run out of room to deal with them this time, so we invite you to join us again next time around as we compare the respective levels of technology between the amateur and CB services.


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# scan *by Russell Bryant*

## FREQUENCIES, CODES and EVERYTHING ELSE YOU WANT TO KNOW ABOUT SCANNING

**All frequencies are FM and all times are local, unless stated otherwise.**

### THE MISSING LINK

***Back in the good ol' days,*** radio users only ever required coverage over a limited distance. Be it a suburb, city or country town, a transmitter located on top of the office building or headquarters was sufficent to meet those needs.

As the population increased and spread out to areas previously unoccupied, the need for radio coverage also increased. The old transmitter located in town was no longer adequate. Transmissions became unreadable once the mobile went beyond the limits of a built-up area.

To address the need for enhanced propagation, users looked to high buildings and prominent geographical locations outside of their capture areas for the placement of repeaters and transmitters. On doing so, they discovered that a reliable method of delivering the audio from the control room to the remote mountain-top site was also needed. One of the best ways was to run special telephone cables to the site, thereby enabling communications to outer regions. The cost of leasing such 'landlines' as they are called was and is not cheap.

As some of the sites were lucky to have power, never mind telephone facilities, together with the massive expenditure required to install the landline, a cheaper alternative was being sought.

### LINKING IT TOGETHER

***Before long*** a less expensive and easier method of carrying the audio to the high point was developed. The use of radio links proved in a small measure to be the alternative system users were looking for. A link is generally a low power frequency fed into a directional antenna aimed carefully at the remote site. In turn, a similarly directional aerial is located at the repeater site, it receives the low power frequency, patches it into the high power transmitter which then broadcasts over the greater distance and vice versa. So that the control can hear audio coming from the mountain top a second link frequency is often employed as the return path.

Located throughout the high power land mobile allocations are groups of frequencies designated solely as link or point-to-point services. The majority are usually of 1 to 5 watts output and fed into yagis or similar.

Monitoring links can sometimes provide the enthusiast with previously unavailable transmissions. A prime example of this is the NSW Ambulance. Because they use simplex VHF, the base 'booms' in, however it is often necessary to be close to the car to be able to monitor it. A link taking the audio to and from the remote site carries both sides of the conversation. No need to miss out on any of the action.

Because different radio users have different requirements for their systems, it may be necessary to listen on the downlink for the cars and the main transmitter frequency for the base. Until you listen in on someone, there is no easy way to determine whether the link is the only frequency that needs to be monitored.

### LONG RANGE, LOW POWER

***Whilst the power output*** of the link is usually fixed between a few milliwatts and 5 watts, there are no rules that govern in which band the link will be located. With only one possible exception -- the distance the link has to cover. Some links are needed only for a short distance, less than 40 kilometres, others fire over hundreds of kilometres linking several sites back to a central control point.

To avoid confusion between links and bearers, the general rule is, a link frequency is one below 1000 MHz, whilst a bearer is above 1000 MHz. Basically however they perform identical functions.

To give an example of how links can be of benefit to scanner users, I was parked in the main street of the central western NSW town of Dubbo. On a 460 MHz link I was listening to the police in Bourke, 400 kilometres away. Tuning in the regular 83 MHz band I was unable to hear anything, the link however provided excellent coverage for the entire journey north. This is one extreme case, not all links are as good as that one.

### MULTIPLE USERS

***Because link frequencies*** are low power and directional, their paths are defined. To hear a transmission it may be necessary to be within track of the beam, or at least close to the rear or side lobes of the yagi antenna. Another factor that bears consideration is, a link frequency may be on issue to several users within your capture area. As links are low power and directional, it is possible to have many users on the one allocation, without interference.

The standard link allocations between 30 MHz and 1,000 MHz are; 44.630-44.850 MHz, 149.000-156.000 MHz, 403.000-414.500 MHz, 450.500-462.000 MHz, 830.0125-875.9875 MHz, 891.000-965.000 MHz.

As you search the link bands it will become obvious just how important these low power, directional RF paths are to effective two-way communications. A good radio system designer can link together hundreds of kilometres of countryside, providing almost total area coverage. Let me know about any missing links that you might find.

## *MAILBAG*

### POLICE QUESTIONING

***Is the AR 1500 any good?*** asks Peter, Daw Park SA. I have just finished putting the AR 1500 through its paces. Look for the review of these excellent little handhelds elsewhere in this edition of CBA. As to the data system used by VKA, the South Australian Police data system operates on 868.7625/823.7625 MHz. Similar systems are used throughout the world, including many American police departments. I don't have any details as to the specific countries and or organisations. At the time the SA police installed the system it was current, no doubt technology has overtaken it.

### BLAST FROM THE PAST

***JW, Sanctuary Point NSW,*** has acquired a relic from the good ol' days of scanning. The GRE 10DS Digi Scan was an early attempt at synthesising scanners, previously dominated by crystals. A card with 'windows' created the frequencies, the scanner in turn read the card as binary and the frequency was 'stored' in memory. Our reader would be interested in hearing from anyone with a circuit diagram, additional cards or anything at all. Drop me a line here at SCAN if you have any information on the GRE 10DS.

### LOW & HIGH POLICE

***AH, Traralgon VIC,*** is interested in monitoring the American lowband VHF police allocations. He is wondering which scanners can receive the 30-50 MHz band. There are many models available that cover the lowband. The PRO 2004, 2005 and 2006 Tandy receivers, AR 2500, 2800 and 3000 mobiles, AOR 1000 and 1500 handhelds, Alinco DJX1 and finally the Icom IC R1, R100, R7000, R7100 and IC R9000. The frequency for Victoria Police district Q, incorporating Morwell, Moe, Traralgon, Warragul is 168.310.

### PERTH VHF PROPAGATION

***SW, who is a cameraman*** with one of Perth's television stations, sent in a very extensive list of frequencies used by his station to keep track of what is going on in and around the WA capital. On 73.250 and 73.280 is Education Department Security, Corrective Services Transport 73.370, Naval Police 73.400, Naval Fire 73.490, Naval Security 73.640. WA Fire Brigades use 76.130, 76.430, 76.460, 76.550, 76.580, 76.610, 76.670, 76.805, 77.060, 77.090, 77.120, 77.225 and finally 77.240. Country ambulances can be monitored on 79.600 and 79.630.

CALM (Conservation and Land Management) also use VHF 80.610, 80.805, 80.820, 80.835, 80.850, 80.865, 80.880, 80.895, 81.030, and 81.240. More from this comprehensive list in future issues.

### NORTH OF THE BORDER

***Ian, Southport QLD,*** is seeking frequencies used in and around the popular holiday destination. Telecom uses 500.050, 500.125 and 500.250. Wormalds Security 166.240. Some of the frequencies used by media groups in the SE corner are Radio 4IP 157.750, Radio 4BK 169.990, Radio 4MMM 167.110, Radio 4KQ 507.950, Radio 4BH 508.925, QTQ 9 165.940, TVQ 10 487.100, 487.200, 487.400 and

CONTINUED OVER PAGE.....

488.7, ABC 487.925 and last but by no means least BTQ 7 488.625 (sorry Mark H).

## CFS FX

***MB, Reynella SA,*** checks in with an accurate list of frequencies for the SA Country Fire Service. The numbers are: CH.1 163.630 helicopters, bombers and State HQ; CH.2 163.120 State HQ, statewide; CH.3 163.240 State HQ, statewide; CH.4 163.300 Mitcham Hills, Lameroo; CH.5 163.210 Stirling; CH.6 163.270 Tea Tree Gully, Salisbury, Beachport; CH.7 163.090 Noarlunga, Murray Bridge and Berri; CH.8 163.150 Happy Valley, Mt. Barker, Goolwa, Yorke Peninsula, Strathalbyn; CH.9 163.420 Onkaparinga, Gawler, Streaky Bay; CH.10 163.060 East Torrens, Burnside, Robe and Kimba; CH.11 163.360 Barossa, Mt.Gambier, Mannum; CH.12 163.075 Pt. Wakefield, Riverton; CH.13 163.165 Kangaroo Island; CH.14 163.285 Willunga, Victor Harbour; CH.15 163.195 Naracoorte and Clare; CH.16 163.570 Truro, Kapunda; CH.17 163.405 Port Germein, Mt. Remarkable; CH.18 163.510 Peterborough, Orroroo, Gladstone; CH.19 163.525 Mallala; CH.20 163.540 Port Pirie, Snowtown; CH.21 162.850 and CH.22 164.530 not assigned; CH.23 163.600 Fireground.

## BACK ISSUES

***ST, Bomaderry NSW,*** asks if back issues of CBA and or the SCAN column are available. I am told by the Editor that a number of back issues can be found in the dim dark halls of CBA's Head Office. ST also wonders why the Complete ESG Register for NSW is so expensive and how long would it remain current? The Complete ESG for NSW runs to some 1200 odd pages, it is contained in three volumes, which hold all frequency allocations irrespective of use or user for NSW and the ACT. The act of putting together the data (taken from DoTaC records), editing it, then presenting it in an easy-to-use format requires a good deal of time, time I wouldn't like to devote. The guide will remain current for about a year or so, decreasing as time goes on.

## NEW KID ON THE BLOCK

***Colin, Ferntree Gully VIC,*** is new to scanning and would like to know some airband frequencies for Melbourne as well as police frequencies. The following frequencies are used by aircraft in and around the Melbourne area: Essendon 124.7 approach, 118.9, 129.4 departures, 125.1, 129.8 tower, 121.9 SMC, 127.7 ACD, 119.8 ATIS. Tullamarine 118.6, 120.0, 121.3, 124.0, 122.4, 124.9, 125.9, 125.8, 126.8 flight service, 124.7, 135.7 approach, 118.9, 129.4 departures, 120.5 tower, 121.7, 121.2 SMC, 127.2, 121.7 ACD, 126.6, 123.6, 128.5, 125.5, 127.0, 130.3, 135.3, 127.4, 125.7, 131.0, 130.5, 118.2, 131.3 approach. 114.1 VOR, 132.7 ATIS. Moorabbin 118.1, 123.0 tower, 119.9 SMC, 120.9 ATIS. There is considerable change occurring to airband comms, so there may be a few errors in the above list. Listening Post will reveal all. For Police activity search between 467.850 and 469.425, these are channels 1 and 64 respectively.

## TAXI!

***'Jack', Marangaroo WA,*** asks if anyone can help with the codes for WA Ambulance. I don't have any codes for the Perth Ambulance on file, can another reader assist? Here are some of the taxi companies that operate in Perth: Black White Green & Gold 488.500, 488.800, 489.400. Swan Taxis 488.525, 488.625, 488.775, 488.9, 489.025, 489.175, 489.325, 489.450. The magazine 'Scanner World' died a natural death after it was pointed out to the publisher that over 60 per cent of the frequencies were wrong. Frequency lists for WA are available from ESG GPO BOX 1200 ADELAIDE 5001, for around $40, or the SCAN WEST publication reviewed in this column (see WA scan freqs elsewhere in this issue...editor).
There are no clubs that I know of involved in scanning in WA.

## HANDHELD HF

***Alex, Palmerston NT,*** wonders if the Alico or Icom mini-handheld scanners are suitable for HF monitoring? The Icom and Alinco scanners do cover the HF bands (without the ability to resolve SSB transmissions). Both are handy little sets, however both suffer from a number of similar faults. HF reception on anything less than an external antenna is marginal. The aerial supplied with either set is useless for the reception of HF transmissions. Both the Icom and Alinco are first and foremost scanners, the fact they go down to HF is an added extra. Their manufacturers will only guarantee performance to 8 MHz. The other fault the receivers have is low battery cycle. Both run out of steam after an hour or two of use, they then require re-charging. I'm afraid unless your Sony is at the end of its useful life, I would be hanging on to it, at least until the problems with these Icom/Alinco type receivers are sorted out.

## SECRET CODES?

***SG, Weetangera ACT,*** writes to say the AFP has introduced a three digit code for the dispatch of mobiles. Does any reader know what these codes are? If so drop me a line here at SCAN and I will publish them.

## MYSTERY AIRCRAFT

***Whilst in the national capital,*** Tim, Kambah ACT, heard some unusual aircraft on the Australian Airlines frequency 129.5. The aircraft identified themselves as Speedbird 11 and Delta 4 -- who are they? Speedbird 11 is not the concorde as you first thought, in fact Speedbird is the callsign assigned to all British Airways flights, Delta is the American carrier Delta Airlines. Sorry to shoot you down.

## BANDS, MODES AND MORE

***TF, Bacchus Marsh VIC,*** has a little trouble trying to work out which step rate and reception mode to use whilst searching the bands. Your problem with different modes and steps is not uncommon. Basically there are two AM and FM. Each is broken down into a wide and narrow version of itself. Standard AM and FM are normally used for two-way radio communications. Wide is used for broadcast services. Your radio station 101.1 TT FM is in wide FM, as is television audio. Wide AM is not common and therefore is generally not included in scanners. This is a brief overview of what bands use what mode. 0-30 MHz is usually AM, 30-108 MHz is FM narrow, 108-136 MHz is the AM aircraft band. 136-225 MHz is FM. From 225-400 MHz is the UHF AM aircraft band. 400-1300 MHz is FM. Amongst these 'normal' bands are exceptions to the rule, satellites on 260 MHz use FM, television vision carriers use AM and so on. As far as what steps to use, this again is the rule. 30-50 MHz in 5 kHz steps. 70-85 MHz 15 kHz steps, soon to change to 12.5 kHz steps. 156-157.45 MHz marine 25 kHz steps. 157.450-175 MHz 15 kHz steps, also in the process of changing to 12.5 kHz steps. Both airbands should be searched in 25 or 50 kHz steps. 400-520 MHz in 12.5 kHz steps. Cellular base receive is the frequency that the phone transmits on, base transmit is the frequency on which the phone receives. Wideband services are not Wide FM, it means services that occupy many frequencies, such as television and other broadcast services. The mode doesn't come into it. Digital cellular means the transmissions are in digital rather than analogue. Trunked base receive is the frequency the radio transmits on, trunked base transmit is the frequency the mobile radio receives. For cellular phones use 30 kHz spacing, for trunked 12.5 kHz steps. In summary, it is safe to say that generally any frequency, other than airband, between 30 MHz and 1300 MHz is FM.

## *CONTACTS*

**NAME : Roberta Kirkup**
**CONTACT : Horse Point, BUNWAHL, NSW 2423**
**INTEREST : In selling a Victorian frequency register.**

**NAME : Ian Lyle**
**CONTACT : PO Box 2409, SOUTHPORT, QLD 4217**
**INTEREST : Anything in the South Coast area.**

## *PROPAGATION*

## HANDBOOK OF AUSTRALIAN RAILWAY FREQUENCIES

***It has taken a while*** plus a good deal of blood sweat and tears, however I have just released the 'Handbook Of Australian Railway Frequencies'. I believe it contains the frequency/ies for all Australian railways that use two-way radio. For our friends across the Tasman,

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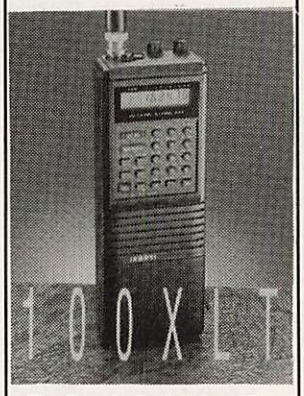

## BC-100XLT

100 channel scanner ..... $329

**BC-200XLT $429**
200ch, LO-HI-AIR-UHF-800MHz

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The best superwideband scanner

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## uniden

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**FAX (07) 397 7269 man**

CONTINUED FROM PRIOR PAGE.....

New Zealand Railways are also included. More than a frequency guide, the HARF contains track data, locomotive rosters plus much much more.

The 80-page A5 size publication (about the size of CBA folded in half), is a must have for the serious railway monitor or train enthusiast.

The Handbook of Australian Railway Frequencies is avialable for $19.95 plus $2 post and handling within Australia, or $3 to NZ. Write to me at PO BOX 344 SPRINGWOOD 2777. Please make cheques etc payable to me.

## LEGION AIRS DIGITAL

***The days of listening in*** as a taxi dispatcher blasts a driver for an infringement of the rules are numbered.

So to is the banter that exists between drivers and their radio operators.

One of Sydney's largest taxi companies is going digital with the claim that it will shave up to five minutes off the pick-up time.

Legion Taxis are spending in excess of $1 million to install the very successful 'Raywood Dispatcher Three' technology.

A telephonist takes the incoming call, then commits it to the memory of a computer.

The computer queues the job and dispatches it directly to the next available car. If the driver fails to acknowledge the job within seven seconds, he goes to the end of the queue. Some voice channels will be maintained for urgent communications.

For those who are interested, Legion's frequencies are, 486.725, 486.750, 486.775, 486.800, 487.025, 487.625.

## 'SCANWEST' FREQUENCY REGISTER

***Scanners basically have not changed*** since their inception 20 or so years ago. They still scan, search and receive frequencies. The 'bells and whistles' attached to them have improved as has their frequency coverage.

What has developed at a stagering rate is the dissemination of information. Frequencies. Without them a scanner is useless, they are the life blood of the hobby. I have made mention of this before, frequency guides, user registers, call them what you will, they are a boon to the enthusiast. Irrespective of the format used, they all display frequencies, system users, callsigns and often transmitter locations. You can extract as much or as little information as you please, depending on your involvement.

What is all this about?

SCANWEST is a frequency register aimed exclusively at the West Australian hobbyist, at the moment. Printed in A4 format the 227-page document contains frequency information from 25 MHz to 1500 MHz inclusive.

According to the introduction pages, an update will be published every six months, in January and June of each year.

Data is listed in vertical columns, labelled Frequency TX and RX, Location TX and RX, User's Name, Callsign and finally transmission Mode. Interspersed amongst the frequency lists are pages displaying band names, or specific users, or codes and callsigns.

Examining the text, I determined that the majority of information is taken from the DoTaC Public Access Register. No argument with that. What did concern me was the use of the generic term 'Government', especially when the user was obvious.

For example,
TX=468.300,
RX = 458.800,
LOCATION = Watermans,
USER = Government,
CALLSIGN = VKI,
MODE = NFM.

I think that everyone in WA would recognise the callsign VKI as that of the WA Police, so why not say so.

The chances of being wrong are limited. When a user cannot be determined the use of the term 'Government' is acceptable.

Apart from that criticism, the SCANWEST guide does the job.

It clearly lists all the usable data from offical and other sources. For West Australian readers the guide is available from most radio stores or from RADAR, PO Box 297, CLOVERDALE, WA 6105.

Retail is around $40. An alphabetical as well as frequency format is being planned for the January 1993 edition.

## AR 3000 QUIKFIX

***As reported previously in SCAN,*** the AR 3000 has a few problems with voltage variations. If the voltage drops below a certain point or the supply is not regulated, the microprocessor locks up thereby rendering the unit unusable.

KB from Dannevirke, New Zealand, passes on some information for AR 3000 owners that may help when the unit locks up.

His letter states, remove all power from the set, lay the receiver on its back, remove the four screws that secure the bottom shell to the chassis. Note the printed circuit board directly behind, and is a part of the front control panel. Connect the 12 volt supply to the radio and switch it ON.

Discharge any static electricity from the body. On the rear of the aforementioned PC board, near the bottom centre, is a small silver switch with a black push button.

This is the Reset switch, depress the switch, it should reset the microprocessor and cure the lockup. Refit the case and reprogram the radio.

## UP, UP AND AWAY

***To those dedicated airband enthusiasts,*** the name Bob Bell is well known, as is his book 'The Australian Airband Guide'. Printed two years ago, the TAAG exceeded all expectations.

In keeping with the dynamic nature of air comms and the hobby that has grown up around it, Bob has just released his very much changed and updated 'Listening In To Aircraft Radio'.

A complete change of format (A5 to A4), together with an increase in frequencies and information, makes the new guide a must for all aircraft enthusiasts, irrespective of whether you are a casual or dedicated listener.

Major city airports, minor regional airfields and a very extensive collection of international airports feature in the frequency listings. A first for Australia.

HF, VHF, UHF and SHF air allocations are covered as is non-airband channels that are associated with aircraft, such as security, ramp and baggage handling frequencies. The inclusion of aircraft reporting positions, decoding of pilot terminology as well as military aircraft callsigns (which are the most up-to-date available), take the hard work out of monitoring the bands.

'Listening In To Aircraft Radio' is available from Airband Communications, PO Box 16 Georges Hall NSW 2198 for $19.95 plus $3 post and pack.

## WHERE ELSE BUT...

***In past issues of SCAN,*** I have reported the on-going legal battle between Uniden (plaintiff) and AOR Ltd and Ors (defendant).

The case has been before the United States District Court for some time now. For those who don't know, Uniden is alleging that it is the owner of the patent for the circuitry that makes scanners scan. AOR says otherwise.

In April 1992 the US District Court found for the plaintiff and confirmed its rights to the technology. In otherwords AOR is liable to pay damages to Uniden for patent infringement. The amount of damages has yet to be determined, however in the meantime AOR is appealling the judgment.

Icom accepted Uniden's claim that the patent was valid and enforceable, thereby settling out of court. The battle continues.

Ever thought about writing to SCAN, others are interested in what you have to say, what you listen to, plus any questions you may have. The address to write to is:

***SCAN***
***PO BOX 344***
***SPRINGWOOD NSW 2777***

**Please remember a stamped self-addressed envelope if you require a personal reply.**

*GME - Electrophone TX-850 . . .*

# A PHONY CAR PHONE OR WHAT A PHONY

*By Ken Reynolds*
*POWER BAND COMMUNICATIONS*

**For most of us who can't justify the expense of a real cellular car phone but would still like to be seen as keeping up with the Joneses, the new GME TX-850 AM only, 40 channel CB rig is the ideal 'toy', and just in time for Christmas.**

The TX-850 is so genuine looking it is difficult to tell the difference between this neat little CB rig and the real thing.

The keypad and display window on the handset are softly illuminated and like the real thing the numeric keypad enters the desired channel number, initiates the SCAN function or DW (dual watch) feature. The UP and DOWN arrows allow you to step in channel increments or decrements in preference to keypad entries. There are two priority channel keys having different levels of importance; the CHannel 8 button takes priority over all other channel functions, even in the SCAN mode, while the second key shows a preference for CHannel 15 but not to the exclusion of all other functions.

Channel 15 is the call channel in the New Zealand CB frequency allocation where this model rig is also marketed. It has been retained on the Australian model in order to simplify supply logistics.

Set in the side of the handset are rotary edge controls for volume and squelch while the PTT switch is a slim-line lever operated by light pressure along the other

**From GME-Electrophone comes a new 40 channel AM only CB rig dressed to impress as an authentic looking cellular car phone replica.**

side of the hand piece. The handset must be lifted from the cradle to transmit, however, an acceptable size speaker mounted in the cradle assembly provides plenty of audio with the 'phone' in the 'hung-up' condition. A slide switch on the side of the cradle mutes the speaker if desired and a second adjacent slide switch turns on and off the transceiver.

## 10 MEMORY ALLOCATIONS

The TX-850 also offers 10 memory allocations for your favorite channels, but with simple keypad entry of channel numbers the memories tend to be a little extra guilding on the already attractive lily.

We were surprised at how well the channel scanning feature works. With most AM rigs the squelch is such a sudden death device that only 'shot-gun' strength signals will activate the audio circuit.

The TX-850 has better gradient than many and the squelch can be adjusted to operate over a good range of signal strengths with just one setting.

The receiver is a double conversion superheterodyne with a quoted sensitivity of 0.7 micro volts for 12dB SINAD. We measured it at about 0.5 micro volts for 12dB SINAD with adjacent channel rejection in excess of 60dB.

The transmitted audio signal sounds quite sharp - probably an electret microphone insert - with 3.8 watts of RF output power and all unwanted spurious products down in excess of 70dB. Quite a 'clean' little transmitter.

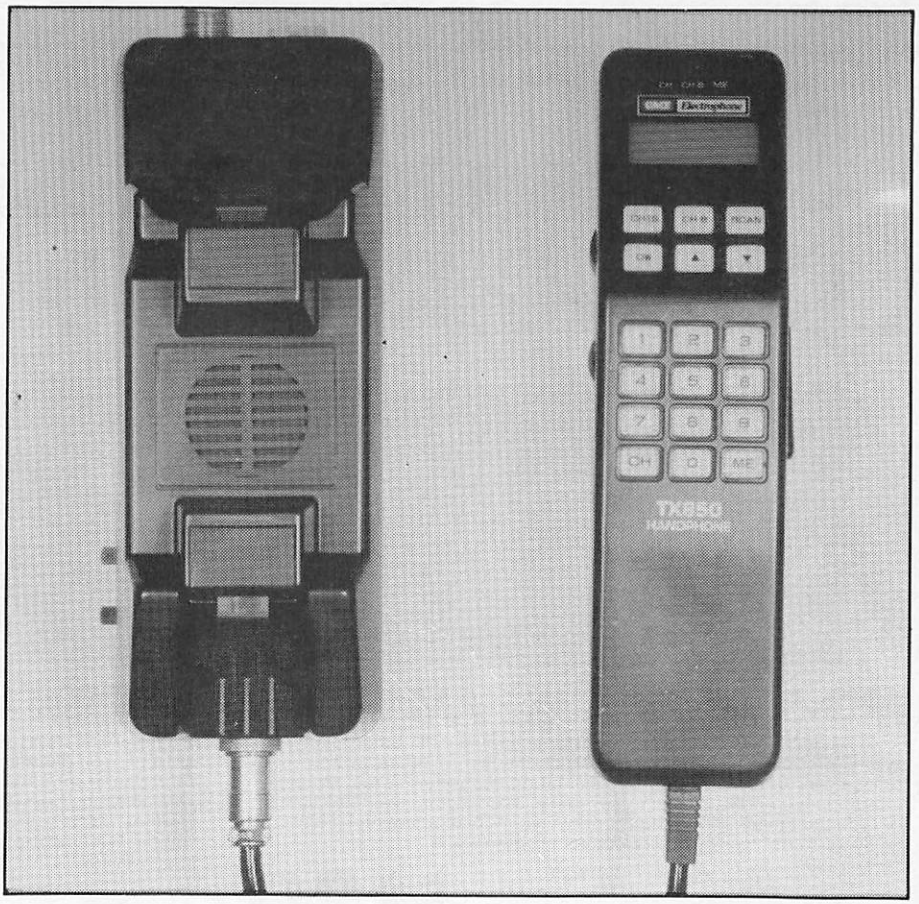
The average modulation level was around 50 per cent but this could be encouraged up to around 90 per cent by speaking more loudly.

## DUAL WATCH FUNCTION

The Dual Watch function allows you to monitor one channel while keeping an ear on a second channel.

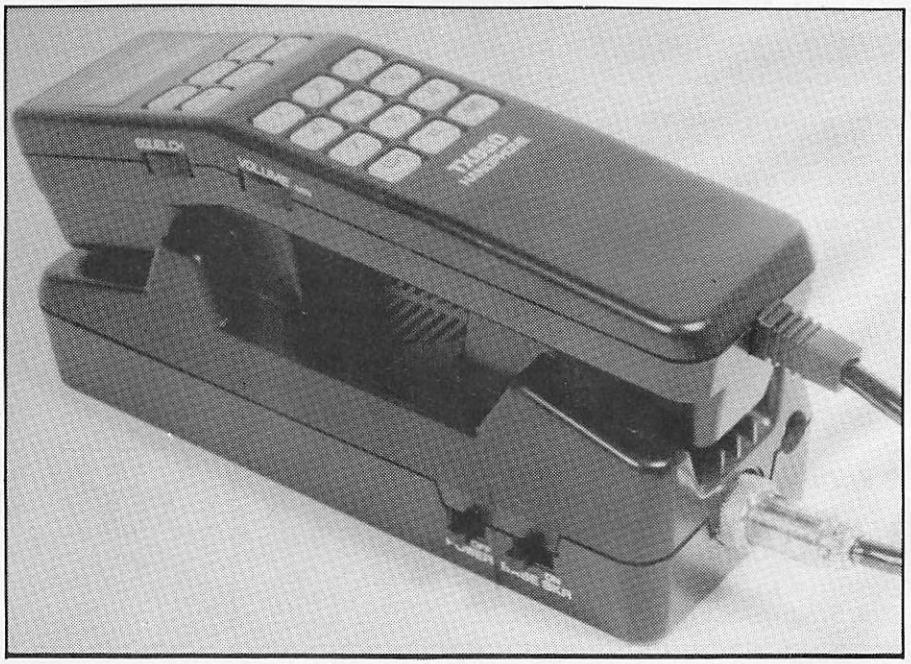
The channels are user programmable and DW swaps between the selected dial channel and any one of the memory channels.

The TX-850 handset and cradle cases are made from moulded black plastic with the antenna socket and power receptacle mounted in one end of the cradle casing.



At the opposite end of the cradle is an eight-pin socket for connection of the handset, the curly-cord of which might be a bit longer and a little more pliable for ease of use.

As far as we could tell, the usual 'hands free' feature supplied with cellular car phones has been omitted on this look alike.



### SUMMARY

**This is by far and away the best rig of its type we have encountered over the years. If you decide to buy one of these flashy little units, at least you can't get caught out making bogus 'phone' calls on a plastic toy replica that doesn't even work.**
**The TX-850 actually transmits and receives and its rating of pretentiousness on a scale of 1 to 10 is only about a six.**
**The DoTaC connection fee is only $18 annually and all calls are free.**

# DICK SMITH ELECTRONICS

# COMING IN LOUD 'N' CLEAR!

## PRO-520XL DELUXE AM CB

From its sleek, black casing to its instant channel nine (emergency) switch and powerful 7-watt audio output, the Pro-520XL is a whole lot of transceiver for this low, low price! Featuring separate volume, squelch and RF gain controls, it's very easy to use. Also includes a noise limiter for reduced ignition noise, heavy duty mic, mobile mounting kit and public address facility (requires optional speaker).

Cat D-1235

uniden 2 Year Warranty! **$139**

## UNIDEN UH-011 UHF CB

It's here! The new UH-011 follows on from the popular and reliable UH-001. You get the same high quality construction, plus a new improved front panel and handy signal strength meter. What's more, it retains all the best features of the UH-001, including repeater access facilites, Tx & Rx indicators, superb audio quality and a tone squelch option. With microphone and mounting kit.

Cat D-1766

uniden 2 Year Warranty **$299**

*Fits In Your Pocket*

## 70 XLT SCANNER RADIO

Listen to the fascinating air waves around your city! This lightweight handheld VHF/UHF scanner has 20 memory channels, 8 band coverage (Covers 66-88, 136-174, 406-512MHz) and track tuning for improved performance. With rechargeable NiCad battery pack, AC charger and carry case.

| | |
|---|---|
| Frequency Coverage: | 66-88MHz<br>136-174MHz<br>406-512MHz |
| Sensitivity: | 0.4uV 66-88MHz<br>0.5uV 136-174MHz<br>0.7uV 406-512MHz |

Cat D-2740

**$269**

*2 Year Warranty*

uniden

**Exclusive to Dick Smith Electronics**

## YAESU FRG-9600 VHF/UHF SCANNER

This exceptional scanner has an impressive array of features and offers outstanding value. Frequency selection is by keypad or dial and there are many advanced scanning functions including — busy channel, clear channel, audio scan, specific band scanning, scanning of the 100 memories and much more.

It covers the complete 60 to 905MHz VHF/UHF spectrum in all modes - FM, AM, CW, and SSB to 460MHz. FM-wide covers FM radio and TV sound transmissions while FM-narrow covers commercial two-way communications - emergency services, police, business, UHF CB, military and amateur radio. Aircraft bands plus other amateur frequencies are accessed through the AM and SSB modes.

**Specifications**

| | |
|---|---|
| Frequency: | 60-905MHz continuous (up to 460MHz for SSB) |
| IFs: | 47.754MHz, 10.7MHz, 455kHz |
| Sensitivity: | FM-n (12db SINAD) 0.5uV<br>FM-w (12db SINAD) 1uV<br>AM-n (10db S+N/N) 1uV<br>SSB (15db S+N/N) 1uV |
| Tuning steps: | FM-n, AM-w 5/10/12.5/25kHz<br>FM-w 100kHz<br>AM-n, SSB 100Hz/1kHz |
| Voltage: | DC 12-15V |

Cat D-2825

**Only $999**

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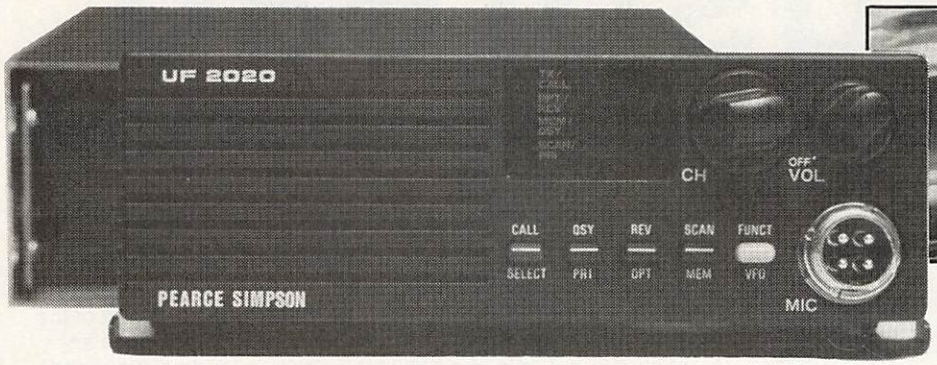


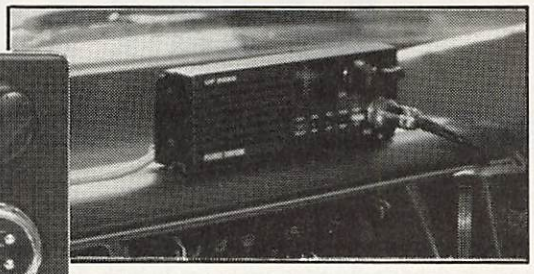

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# UF-2020 SCANNING UHF CB

The new Pearce Simpson UF-2020 is our most sophisticated scanning UHF CB and has new features for greater convenience and enhanced performance. A remote-mountable front panel with an inbuilt speaker and supplied extension cable allows you to mount the rig's panel on your dashboard and have the main body of the rig relocated out of the way (under a seat). In addition, its dual microprocessor design provides a number of scanning functions (including open scan, group scan and a priority channel with 4 selectable modes ) plus a repeater reverse mode, programmable one-touch recall CALL channel and digitally adjustable squelch system. Specialised functions include a programmable timeout timer and selectable squelch hysteresis. All settings are stored in an internal memory located in the transceiver's front panel and automatically saved when the transceiver is switched off at its on/off switch. Comes complete with microphone, mounting brackets (rig and front panel), extension cable and DC power cable.

Cat D-1802

**Now Only $399**

# PULL IN THAT SIGNAL!

## DIAMOND D-130J DISCONE ANTENNA

This quality Japanese discone antenna covers the frequency range 25-1300MHz and comes complete with mast mounting hardware and instructions. It's easy to assemble and install and has extensive stainless steel construction — making it extremely durable! Its wide frequency coverage makes it ideal for use with scanning receivers, as well as transmitters up to 200W P.E.P for the 6m, 2m, 70cm and 23cm amateur bands.

Cat D-4840

DIAMOND ANTENNA

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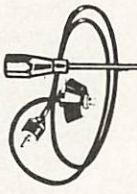

## UHF CB 4dB ANTENNA PACK

MOBILE ONE

A high quality stainless steel 4dB antenna with UHF antenna base. It's exceptional value, durable and easy to install. Includes 3.6m of high quality Mil-Spec Coax, fitted with a PL-259 plug, and instructions.

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## 1.5M HEAVY DUTY ANTENNA KIT

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A complete, heavy-duty 27MHz CB antenna kit in one pack! Comes with rugged 1.53m 'Superhelical' medium to long-range antenna, heavy-duty stainless spring and base with cable and plug. It's the economical way to buy!

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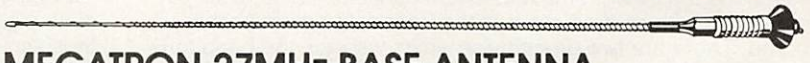

## MEGATRON 27MHz BASE ANTENNA

A superb 5.75m ground-independent 'no-tune' base station antenna from Benelec. It uses a matching network in a sealed, thick-walled base housing, giving excellent corrosion protection. It also allows high-power operation (up to 1000 watts) while maintaining low SWR across the band. High quality T81 grade aluminium tubing and stainless steel screws ensure excellent durability. The base section is water-sealed with a DC ground path for static reduction and an SO-239 socket for easy coax connection. Comes complete with mounting hardware for connection to your mast.

Cat D-4430

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**$89.95**

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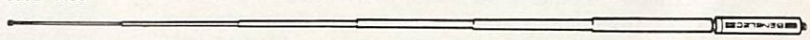

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# bandspread

FROM DC TO DAYLIGHT *with Greg Towells*

## TANDY PRO 2004 MODS

The Tandy PRO-2004 scanner is a proven performer, with many in service everywhere I care to look. They are also easy to modify to get lots more features out of or increase the existing capabilities. If you would like to increase the channel capacity to 400, increase scan and search speeds, and change the stepping rate in the 800 Mhz area to the correct 30 Khz steps, try this modification.

Remove the four screws from the rear and slide the cover off. Turn the unit upside down with the controls facing you. In the centre you will see a large board with five plugs connected to it and a metal shielding cover. Remove the cover, and locate diode #D512 and cut it in half. You should notice the next two diode positions are vacant (eg D511 & D510 and are not marked) also you will notice that there is a position vacant where D 514 should go.

Now for the hard part.....remove the cable connector closest to the diodes (CN501) and remove the seven screws and turn the board over. Fit a diode across position 514 noting the same polarity as the others (cathode faces upward) also fit one across position 510 (use 1N48 Silicon or eq). The holes are plated through so there may be a bit of a hassle in removing the solder. A decent solder sucker would be a handy tool for this job.

Re-assemble the radio, checking first that no wires or solder have ended up where they shouldn't be. Power up the radio for the obligatory smoke test, and check the results of your handiwork. You should have 10 banks of 40 memory channels, it will scan and search faster, and will step in 30 Khz steps at 800 Mhz. As a bonus, you will find that your stored memories will not have been affected by this mod.

## PRO-2006 KEYBOARD BEEP DELETE

Do you have a PRO-2006 scanner, and does the keyboard beep drive you up the wall? Some people desire the keyboard to beep when touched, others just can't stand it. For those who want to get rid of it, here's what to do.

With the top cover removed, locate connector CN3, a 15-pin connector with colored wires at the front of the main circuit board. There are two procedures which will stop the beep tone from being heard through the speaker; read both to decide which procedure you want to follow.

1. Find the centre grey wire coming from CN3 and cut it midway to disable the beep tone. You may wish to solder a resistor in series to reduce the beep volume, a trimpot to vary the volume of the beep tone, or a miniature switch to choose between beep and no beep.

or

2. Using a pair of needle-nose pliers, CAREFULLY pry the plug from CN3, revealing a row of pins. Locate the centre pin (#8) which corresponds to the grey wire and bend it down flat, disabling the beep circuit. Re-insert the plug. The pin may be erected again later to restore the beep tone if desired. This completes the restoration procedure. Re-attach the cover and replace the screws.

## MOBILE SCANNING ANTENNA

Do you take your scanner mobile? If you do, undoubtedly you will have faced the problem of what antenna to use. You could always resort to the supplied 'dummy load' but these tend not to give good results when used within the vehicle. In these circumstances, an external antenna is a must. Alright then, mount a base as high as possible, the roof being best and attach an antenna to that. Here comes the next dilemma, what sort of antenna do you use?

If your main area of interest is confined to the one part of the spectrum, maybe the police UHF channels, the obvious answer is to get hold of a dedicated antenna for that frequency span. This set-up will give outstanding results, much better even that the scanner and its own antenna used outside. What happens when your interests involve listening to the police, a spot of aircraft, the ambulance or fire channels as well as listening to amateur and CB operators, all in the one scan?? Do you get hold of an antenna suited to each band? Could be a bit inconvenient undoing and doing up antennas in the traffic.

I do a lot of driving just to get to work, and my scanning interests change from day to day, so I needed a solution to this problem. Along came the Benelec scanning antenna. This is a white, helically wound antenna with something like four loading coils along its length. It stands only a metre long which is a convenient length to use and to store in the car. Right then, throw the scanner into the car (gently!) and try out this antenna.

First off, I noticed that it dramatically improved reception on almost all frequencies that I regularly program into my usual scanner, compared to the standard antenna. The UHF area (450 to 500 Mhz), and the high VHF (130 to 170 Mhz) seemed to be the best area of improvement, with stations I had not noticed before coming on and annoying me. Maybe they selected that morning to front.

The aircraft band also came good, with some very good signals being received from a long way out. Low VHF was interesting enough, with the Benelec mobile scanning antenna enabling the reception of many transmissions from various drive-through restaurants scattered around Sydney.

800 Mhz wasn't quite as good as expected, but there isn't too much to listen to up there anyhow.

Overall, I regard the Benelec mobile scanning antenna to be quite a good compromise antenna for the mobile scanning enthusiast who needs a multi-band antenna. My thanks to Andrews Communications Systems, Greystanes for the look at this antenna.

## SCANNING SPEED INCREASE FOR ICOM R7000 SCANNER

The Icom IC-R7000 is one of the new breed of super scanners that has been around for a few years now, being a notch above the many models with hundreds of channels and vast spectrum coverage. In fact, the professional performance and features of the R7000 and the like means that they are more accurately described as VHF/UHF communications receivers. The R7000 does have its drawbacks however, and one of these is its slow rate of scanning and searching.

The front panel SCAN SPEED control on the R7000 receiver allows the user to adjust the speed of scanning and searching operations, as well as the rate at which the priority channel is sampled. Rotating the control counter-clockwise decreases the speed, and rotating it clockwise increases the speed. When the SCAN SPEED control on a standard R7000 is turned fully clockwise, the maximum scan rate of the radio is only about 8 channels per second, or a search rate of 8

steps per second. This works out at about the same as the old Tandy PRO-30, and heaps slower than an AOR 1000. On a receiver of this calibre, I would expect a bit better performance, speed wise, than this.

## THE MODIFICATION

Carrying out this modification is relatively easy, and only involves the same steps as used when installing the optional Remote Controller or Speech units.

Use a suitable cover over your work area to avoid damage to the R7000 cabinet. Disconnect the R7000 from the AC line, and turn the radio upside down.

Remove the bottom cover by removing the 12 screws holding it in place. Remove the four screws holding what ICOM terms the "partition panel". Pictures on pages 32 and 34 of the R7000 Instruction Manual show the partition panel. After removing this panel, the component side of the LOGIC UNIT circuit board is accessible.

Locate R18, a 270K ohm 1/8 watt resistor, near connector J5. You may wish to remove plug P5 from J5 temporarily if it gets in your way. Carefully solder a 470K ohm resistor in parallel with R18.

Use a 1/4 watt resistor here for its small physical size. That's all to the modification, reassemble the radio, being careful with the self-tapping screws, and plug it in. The radio should be fully functional, with no decrease in receiver performance.

After the modification to the R7000, the scan and search rates are still adjustable using the SCAN SPEED control. You will find that the R7000 scans along at about 13 channels per second with the speed control fully clockwise and won't miss weak signals. For such a simple mod, it is a worthwhile improvement.

## DX NETS ON UHF CB

While scanning the UHF CB band lately, I have come across fairly reliable indicators of dx on the bands.

No, not ducting or backscatter, but it seems the locals in parts of Sydney have taken to co-ordinating their search for DX on 27Mhz and other frequencies on various UHF CB channels.

This has happened on a number of occasions that I am aware of, and they helped to alert me to openings when the band seemed fairly dead only a short time before.

I think this is a pretty good idea. Too many times I have listened to the combatants on the frequency with the DX, conducting their conversations about the state of the ionosphere, while the DX station was being blotted out in the background.

This way, the UHF channel is used as the liaison channel, helping keep the channels with the DX clear for the DX. If a group is after a particular station, only one station need keep a watch on the channel while the rest look around the rest of the channels, with a short call on UHF to alert everyone to the wanted station's appearance.

Of course, if you wanted to make a dogpile of it, you could always announce the presence of overseas DX on UHF repeaters.

All this goes to show that there are good uses for UHF CB, and also that although the sunspot cycle is down in the dumps, there are still good openings to be enjoyed. Get your stations and antenna farms ready for summer.

***Please keep in mind that carrying out any modification detailed in this magazine will almost ceratinly void the manufacturer's warranty.***

***Also, that while every care is taken in presenting any/all modifications, neither the magazine nor its staff accept any responsibility for damage to equipment or injury to the operator.***

***In short, be warned that any/all modifications which are carried out are the sole responsibility of those making the modifications.***


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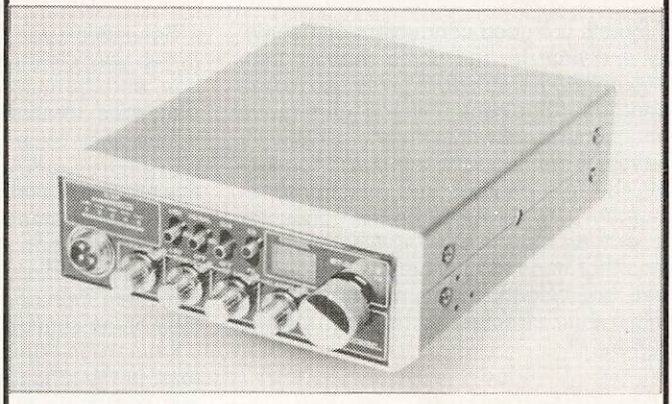

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# SO YOU WANT TO BE AN AMATEUR ?

## The path to amateur radio

*Part four of a regular series by Paul Butler VK3DBP*

### CONDUCTORS AND INSULATORS

Metals are good conductors of electricity and heat for the same reason; their internal atomic structure gives rise to free charges (electrons), which can move about anywhere within the metal. When a battery is connected to a metallic conductor, the free charges in it (electrons, remember) are driven along the conductor to form an electric current. Insulators, on the other hand, do not conduct electricity well, because they have no free charges within their structure to form an electric current.

### SEMICONDUCTORS

Some substances are neither metals nor insulators. They conduct electricity, so they cannot be insulators, but in their pure state, they do not conduct very well. They are known as semiconductors. Silicon and germanium are typical semiconductors, and their electrical properties are best understood by first considering another element, carbon.

Atoms of carbon can bind themselves together very tightly to form diamond. The hard nature of diamond is a direct result of its internal structure. Silicon and germanium both have an internal structure similar to that of diamond, but the bonding is not so secure. Some of the links between atoms are weak enough, in fact, to allow electrons to escape from the atoms and become available for electrical conduction. The gaps or 'holes' left by the escaping electrons add to the conductivity, too.

Normally, silicon and germanium do not contain very many free electrons or holes and so they do not conduct very well. Their ability to conduct can be increased, however, by adding to pure silicon or germanium a small amount of another element called a 'dope'. Doping a semiconductor has the effect of changing its structure enough to free more electrons or create more holes.

### N-TYPE AND P-TYPE SEMICONDUCTORS

Semiconductor materials can be doped in two ways, either n-type or p-type. Silicon and germanium atoms have four electrons available to form chemical bonds with other atoms. Elements like phosphorus, arsenic and antimony have five electrons available, so when they are introduced in small amounts into silicon or germanium, one electron is "left over" from the bonding. These left-over electrons can then contribute to the conductivity of the semiconductor.

Even when doping is not present, holes exist in the structure of a semiconductor and contribute to its conductivity. Electrons are knocked out of atoms by heat. The hole left by a dislodged electron can be filled by another electron from a neighbouring atom, leaving a hole there. This in turn can be filled and so the hole moves through the semiconductor. Hole conduction must be taken into account separately from electron conduction when determining the conductivity of a semiconductor.

The number of holes present can be increased by the introduction of doping of aluminium, boron or gallium into the semiconductor. These atoms have only three electrons available for bonding and so their presence creates holes throughout the semiconductor.

Holes and free electrons exist in all semiconductors. If the doping increases the number of electrons, they become the 'majority carrier' and the semiconductor is called n-type (n for negative). If the doping increases the number of holes present, they are the majority carrier and the semiconductor is called p-type (p for positive!).

**This lesson is all about semiconductors. In many ways, this is a key area, since the topic covers diodes, transistors and other devices, and leads into integrated circuits, commonly found in transmitters, receivers and so on.**

### THE DIODE

On their own, n-type or p-type semiconductors have few interesting properties as far as electronic circuits are concerned. They really become interesting, however, if a junction is made between them. Electrons from the n-type layer cross the boundary and fill up holes in the p-type layer. This removes carriers of both types from around the junction, leaving what is known as a depletion region, in which there are no free charges. A simple p-n junction of this type is known as a semiconductor diode.

The diode has one very important property - if it is connected to a battery so that the p-type layer is made positive while the n-type layer is made negative (the diode is forward-biased), it will conduct electricity. If the battery is connected the other way around (the diode is now reverse-biased), the diode ceases to conduct. A

close look at the junction shows why.

When the n-type layer is negative and the p-type layer is positive, electrons in the n-layer are repelled from the negative terminal of the battery into the p-layer (similar charges repel). Once there, they are attracted to the positive terminal of the battery (opposite charges attract) and carry on around the circuit. Similarly, positive holes in the p-layer move into the n-layer, attracted to the negative terminal, and so current flows through the p-n junction.

If the battery is reversed (n-type positive, p-type negative), electrons in the n-layer are attracted AWAY FROM the junction to the negative terminal. Holes in the p-layer are attracted away from the junction, too, towards the positive terminal. The depletion layer grows larger, preventing current flow through the junction.

## A SEMICONDUCTOR DIODE CONDUCTS IN ONE DIRECTION BUT NOT IN THE OTHER.

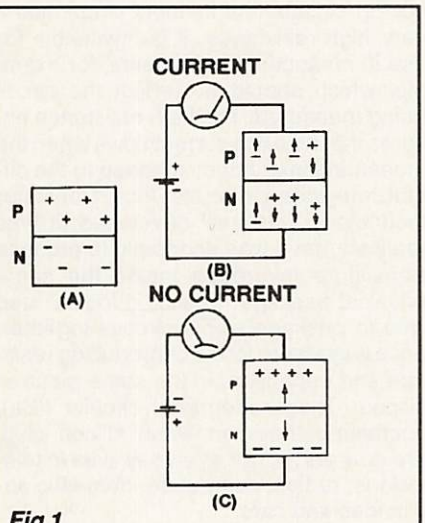


*Fig 1*

It is important to note that:

*** there is in practice a small leakage current under reverse conditions.**

*** no conduction takes place until the forward voltage is enough to overcome the effects of the depletion layer which initially forms at the junction. This requires about 0.6 - 0.7 V for a silicon diode and about 0.2 - 0.3 V for a germanium diode.**

A diode cannot carry limitless current, nor can it withstand high reverse voltages without breaking down. The rating of a diode is usually expressed, therefore, in terms of a maximum current value and a peak inverse voltage (PIV).

Tables of data are available for common diodes and rating values must be studied closely when designing and building circuits. A small-signal diode may be rated at 50 V PIV, 160 mA, while a heavier duty diode for use in a rectifier circuit has a PIV of 400 V and a current rating of 1 A.

## VARICAP DIODES

Voltage variable capacitor diodes (varicaps or varactors) rely for their operation on the natural capacitance of the depletion layer. When a diode is reverse-biased, the depletion layer widens according to the voltage applied. The p-layer and the n-layer are therefore separated by an insulating layer, and the whole setup resembles very closely the structure of a capacitor (see Part 3 of this series).

By changing the voltage applied to a varicap diode, the width of the depletion layer and therefore its capacitance can be altered. If the device is included in a resonant circuit, the frequency of resonance can be controlled, since it depends on the combination of capacitance and inductance in the circuit. The varicap is ideal for inclusion in radio and TV tuning circuits, since the frequency to which the tuner responds is determined by an easily adjusted voltage. A simple variable resistance is all that is needed to tune a varicap tuner.

## ZENER DIODES

The story of zener diodes is really evil. You take an unsuspecting diode, find out its PIV and EXCEED it! Once the diode breaks down under the pressure, it conducts very well and the breakdown is not necessarily permanent, if you're careful. A zener diode is designed to break down at a pre-determined voltage, and provided the current through it is restricted in some way to stop the whole thing melting, it will conduct indefinitely.

In operation, the zener diode maintains a constant voltage across itself. This makes it ideal for inclusion in a voltage regulation circuit, since variations in the unregulated input voltage will be compensated for by the zener diode and the output will be steady.

## THE BIPOLAR TRANSISTOR

A bipolar transistor is essentially two p-n junctions arranged back-to-back. Its configuration can be either n-p-n or p-n-p. The central region is known as the base, and is physically very thin and only lightly doped. The other two regions are known as the emitter and the collector. The operation of a transistor depends on the right voltages being applied to it.

Take a look at the n-p-n transistor, for example. The junction between the p-type base and the n-type emitter is connected so that the base is more positive than the emitter. This junction is forward-biased (think back to the diode) and conducts normally. Electrons pass from the emitter

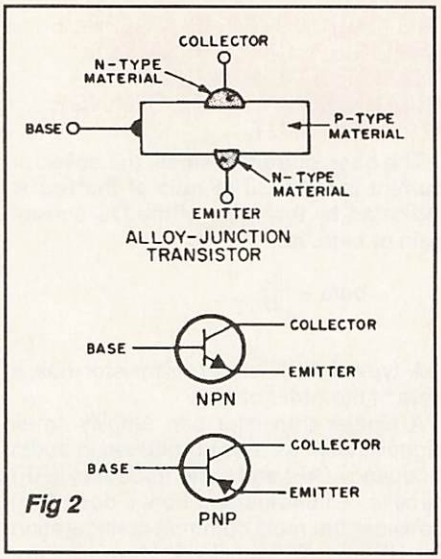


*Fig 2*

into the base region. Because the base is so thin, most of the electrons are swept up into the collector, which is connected to a voltage even more positive than that of the base.

The voltage applied to the base is the key to transistor conduction. If the base is not positive enough relative to the emitter, the depletion-layer barrier (equivalent to 0.2 V or 0.7 V, depending on the semiconductor material) is not overcome and the base-emitter junction, and consequently the whole transistor, cannot conduct - it is switched OFF. If the voltage at the base is steadily increased, there comes a point at which conduction occurs and the transistor switches ON.

## THE TRANSISTOR IS A SIMPLE SWITCH, CONTROLLED BY A VOLTAGE APPLIED TO ITS THE BASE.

If an n-p-n transistor is OFF, no current passes through it and so there is no voltage across the resistor in the collector circuit. The collector voltage is therefore close to the positive supply voltage. Once the transistor turns ON, current flows in the collector circuit and a voltage drop occurs across the collector resistor. The collector voltage is now much lower than the supply voltage. But the transistor was switched ON by a rise in the base voltage. So an INCREASE in base voltage results in a DECREASE in the collector voltage.

## THE TRANSISTOR IS A VOLTAGE INVERTER.

The change from OFF to ON does not take place at a single value of base voltage but over a small range of voltages. This means that if a transistor is close to, but not quite at, its switch-on point, a small change at the base can be enough to produce a large change at the collector. That, in hand-waving terms, is what amplification is all about.

***(continued over page...)***

**THE TRANSISTOR IS A SIMPLE AMPLIFIER, SINCE A SMALL CHANGE AT ITS INPUT PRODUCES A LARGE CHANGE AT ITS OUTPUT.**

The base current is small, the collector current is larger. The ratio of the two is indicated by the value of the DC current gain or beta, ie.

$$\text{beta} = \frac{Ic}{Ib}$$

A typical NPN silicon transistor has a beta of the order of 150.

A bipolar transistor can amplify small signals, such as those produced in audio frequency (AF) and radio frequency (RF) circuits. To understand how it does this, consider the most common configuration for RF and AF amplifiers, known as the common-emitter circuit.

First the transistor is biased. Its base voltage is fixed, using a network of two resistors connected from the positive to the negative of the electricity supply (battery). At this resting voltage, current flows in the base, limited by a resistor in the emitter circuit, and so a (larger) current flows in the collector circuit...Fig 3.

A small varying signal voltage is then applied to the base. This cannot be achieved directly, since the preceding stages of the circuit could change the voltage on the base. Instead, the signal is connected to the base through a capacitor, which allows through the AC variations while blocking any DC changes at the base.

The signal voltage affects the base current, which in turn changes the collector current because of the current amplifying characteristic of the transistor. The voltage across the collector resistor varies according to the input signal, therefore, but the voltage variations are greater than the original signal - the transistor has produced amplification of the original signal voltage.

As well as a capacitor at the input to the transistor, there is one at the output, ensuring that the bias conditions are correct even if the transistor is connected to further stages of amplification. Another capacitor is connected in parallel with the emitter resistor, to bypass this resistor and avoid the voltage drop which would reduce the gain of the transistor stage.

The name "common emitter" refers to the fact that the emitter is part of both the input and the output circuits, that is, it is common to both. Other configurations known as common base and common collector circuits are used, too.Field effect transistorsThis kind of transistor, known as a FET, consists of n-type semiconductor sandwiched between p-type semiconductor (if it is an n-channel FET). Electrons move along the n-type channel from one end, the source, to the other, the drain. Their progress is relatively unimpeded unless a voltage is applied between the n- and p-type layers, through a terminal called the gate.

When a gate voltage is applied, the depletion-layer at the boundary between the n- and p-type layers grows and narrows the channel. This makes it more difficult for electrons to move along the channel and so the current is reduced. The greater the voltage applied, the wider the depletion layer grows and the narrower the channel becomes.In practical terms, a varying signal voltage is applied to the gate, and the subsequent variations in channel current produce voltage variations across a resistance in the drain circuit. As with the bipolar transistor, signals go into and out of the FET through capacitors to avoid upsetting the bias conditions.The most common FET configuration is the common source connection, which is the direct equivalent of the common emitter configuration for the bipolar transistor. The attraction of the FET is that no current flows in the gate circuit. It gives the impression to preceding circuits that its input circuit has a very high resistance. It is invaluable for use in measuring instruments, for example, which should not affect the circuit being measured. The high resistance ensures that no extra current flows when the measuring instrument is added to the circuit.Integrated circuitsOnce transistor technology was well developed, it was realised that it was economic to produce transistors in groups inside the same physical package. The next logical step was to package whole circuits together, once ways were found of producing resistors and capacitors in the same piece of silicon. These integrated circuits (ICs), containing their renowned silicon chip, are now part of our everyday lives in televisions, radios, computers, domestic appliances and cars.

For the Novice course, only knowledge of amplifiers and voltage regulators is

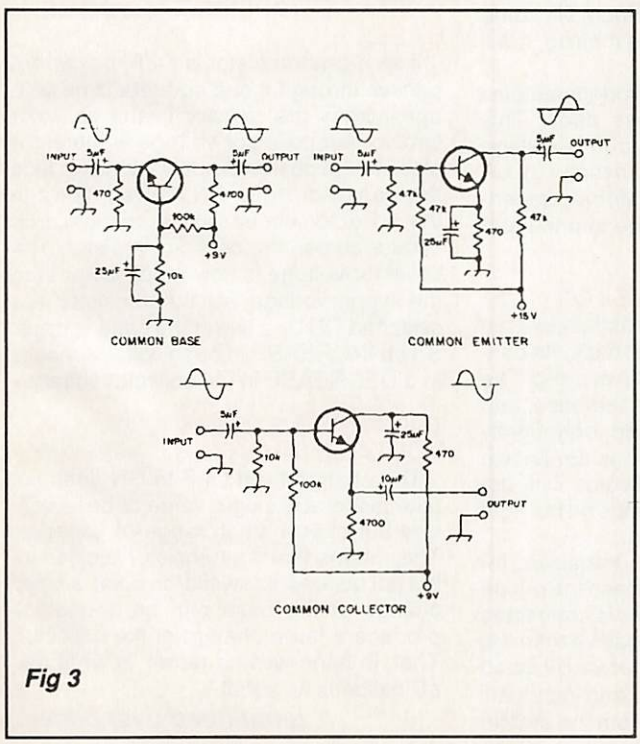


*Fig 3*

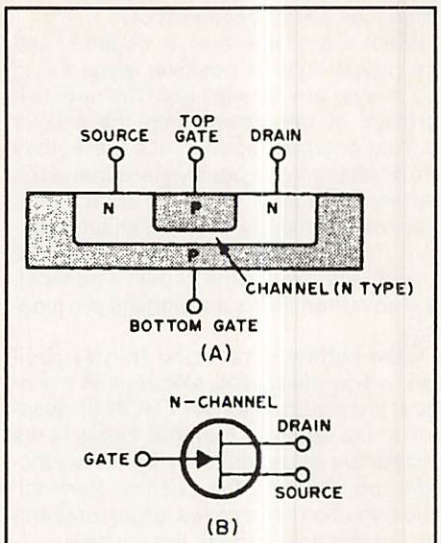


*Fig 4*

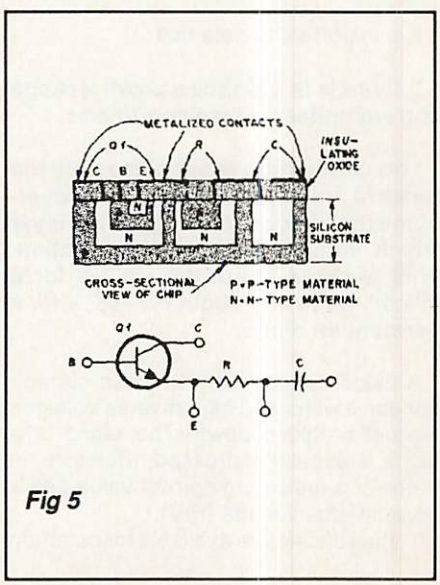


*Fig 5*

needed. A 741 operational amplifier, or op-amp, for example, is essentially a multi-stage transistor amplifier with all its stages built into the same package. Its input-output characteristics are well defined and so it is found in all sorts of circuits where simple voltage amplification is called for.

The only external components are a few resistances and capacitances for biasing, for stable operation and to get signals in and out.

A common simple integrated circuit is often used to regulate the output of a power supply circuit. Once AC has been rectified to DC, the residual AC or "ripple" must be eliminated, especially for high-performance circuits.

A voltage regulator circuit takes as its input a fairly steady DC voltage and produces from it a very stable voltage, even under conditions of varying load current.

An added refinement may be included in the form of current limiting and short-circuit protection, to stop the power supply blowing up if a screwdriver falls across its terminals, and to protect the components connected to the power supply from excessive current flow.

## PRACTICAL LIMITATIONS

It cannot be stressed enough that different semiconductor devices are designed to do different jobs.

Voltage, current and power ratings must be observed if electronic equipment is to operate reliably and safely.

Circuits may be protected in their design against short circuits and component failure, or by suitable fusing arrangements.

Certain high-power components are mounted on heat-sinks.

These are metal contraptions with fins to allow air flow to remove excess heat and prevent thermal runaway, the condition which arises when a circuit takes more current when it overheats, so making the problem worse.

A fan may complete the job of keeping the whole lot cool.

And now for some questions . . .

**1. Varactor (varicap) diodes may be used for:**
(a) AC voltage regulation
(b) adjusting capacitance in a tuned circuit
(c) impedance matching of an antenna
(d) automatic gain control

**2. A correctly biased PNP transistor will conduct when the:**
(a) emitter is more negative than the collector
(b) collector is more positive than the emitter
(c) emitter and base are at the same potential
(d) collector is more negative than the emitter

**3. The amount of forward bias required to enable a silicon transistor to commence conduction is approximately:**
(a) 0.2 volt
(b) 0.6 volt
(c) 1.2 volts
(d) 1.5 volts

**4. The collector current of a bipolar transistor is controlled by the:**
(a) base current
(b) collector voltage
(c) base voltage
(d) emitter voltage

**5. A field effect transistor is able to generate:**
(a) output current variations using input voltage variations
(b) output current variations using input current variations
(c) output voltage variations using input voltage variations
(d) output voltage variations using input current variations

**6. When compared with bipolar transistors, FETs:**
(a) have a lower input impedance
(b) have a higher input impedance
(c) are more influenced by magnetic fields
(d) have fewer connecting leads

**7. The ratio of the collector current Ic to the base current Ib of a transistor is called:**
(a) resistance gain
(b) voltage gain
(c) power gain
(d) current gain

**8. Current gain in bipolar transistors in common emitter mode is often referred to as:**
(a) bias value
(b) back EMF
(c) beta
(d) carrier leakage

**9. The amount of forward bias required to enable a germanium transistor to commence conduction is approximately:**
(a) 0.2 volt
(b) 0.6 volt
(c) 0.9 volt
(d) 1.0 volts

**10. An increase of 1 mA in the base current in a common emitter transistor amplifier causes the collector current to rise by 100 mA. The beta is:**
(a) 1
(b) 10
(c) 100
(d) 1000

**ANSWERS:**

**1(b), 2(d), 3(b), 4(a), 5(a), 6(b), 7(d), 8(c), 9(a), 10(c).**


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# online

*by Patrick McDonald*

**A LL ABOUT COMMUNICATION RELATED COMPUTER PROGRAMS**

**Hello, hello, hello electronics fans! Have you got those receivers, transceivers and personal computers all fired up and ready to go? Well, better turn 'em off for a while and pay attention to this column instead! I've got lots of new info about how you can use your computer as an integral part of your radio hobby, and I don't want lots of humming, buzzing and chattering interrupting what I've got to say. You can turn everything back on after you finish reading CB ACTION magazine, in few hours time!**

So let's go straight away to some new radio-related software, written for those popular IBM compatible MS-DOS computers, just in from the US via our state-of-the-art satellite telephone lines.

As in the past, everything mentioned here in ONLINE is, unless indicated otherwise, in the category of 'shareware', meaning that it's freely available for trying out and exchanging with computer friends and colleagues.

The shareware author only asks for a small fee if you decide to keep his program in regular use on your PC.

Note too that programs which have the .ZIP extension as part of their names require a 'decompressor' to unpack them into an executable format. PKZ110.EXE, among other programs, is available for this use. It's self-decompressing and is itself a shareware program.

## ☐ Where's That Sat?

**SOP9228A.ZIP** and SOP9228B.ZIP are the two parts of STSORBIT PLUS (called STSPLUS for short), designed for serious satellite monitoring freaks, and is the latest of several excellent versions of what I'd call have to call a 'Space Shuttle and Satellite Orbit Simulation' program.

Californian software author David H. Ranson, Jr. released this latest update in July of this year and, boy oh boy, it's a good one!

Inspired by NASA's wall-sized satellite tracking displays, STSPLUS is a program to track the NASA Space Shuttle and other satellites in a similar fashion on your PC's monitor.

Orbital data may be entered manually for particular space shuttle missions and the standard NASA/NORAD 2-line elements may be used for all other earth-orbiting satellites as well as for the Space Shuttle.

The program is CGA through VGA compatible. Naturally, it will look much, much better, even spectacular, on a nice VGA screen!

STSPLUS is easy to install and run, and full documentation is included. Once up, it presents you with a simple menu and the F1 function key provides a very useful demonstration of the program and its many features.

STSPLUS includes a recent file containing detailed orbital information on over 100 different satellites, and updated elements are available regularly from wherever you get STSPLUS.

From the main menu STSPLUS will ask what satellite you wish to view, such as the Hubble Space Telescope, the MIR satellite or the Shuttle.

You can set up any particular orbiting body as a default.

After the desired satellite has been selected, STSPLUS will display a map of the world and the ground track of the satellite. The satellite itself will be a white symbol moving along the ground track.

To display a particular Space Shuttle mission, you press F4 to enter specific orbital information in STSPLUS's simple orbital model. Enter the launch time and date in your local or UTC time, and then orbital altitude and inclination. (For this latter data you can use the program's default data.)

Alternatively, accurate NASA 2-line elements are usually available within 24 hours of a Space Shuttle launch, via the computer BBS network.

The combination of the program's FAST and PAUSE modes will let you look ahead at upcoming orbits and then freeze the display at a time of special interest--such as when the satellite enters your own circle of visibility.

You can then use the "+" and "-" keys to move the satellite position back and forward in time to determine the various times and positions throughout a pass.

Neat feature, huh?

As you can appreciate, STSPLUS makes very complex calculations to determine the position of the Earth, satellite, and Sun. In addition, the graphics operations required to display the maps and the satellite track and position also require a great many computer calculations.

Slow computers or computers not equipped with a math co-processor chip therefore may not be able to perform all of the required calculations and still keep the display synchronised to real time. In order to allow these computers to run STSPLUS and provide most of the available features, a special SLOW MODE is available which bypasses or simplifies some of the more complex or time-consuming calculations and cuts the display update frequency from once per second to once per ten seconds.

Nevertheless, this is hardly a serious drawback for those of you without the latest and greatest computer hardware.

Well, this software does sound interesting, doesn't it? You can sit there in front of your screen and pretend that you're part of Mission Control at the Cape, monitoring the Shuttle in real time, and will have a good shot at picking up NASA comms with your receiver when it passes overhead or racing out into the yard to 'eyeball' the craft as it whizzes by.

## ☐ PC Shortwave Monitor

**Now, let's move on** to something completely different. US-based Scott Gitlin's PCSW20.ZIP, called formally by its author 'PC SHORTWAVE MONITOR,

The Logging Organiser' is a frequency management program designed to greatly reduce the time spent searching general broadcast listings that in many cases do not apply to your own geographic listening area.

Besides organising your various radio loggings, this program will let you create a variety of customised listening schedules to suit your own needs.

Naturally, like any good database, PCSW has features enabling you to quickly locate/edit/delete records of all your frequencies, times and QSLs requested and received.

The program will also generate simple QSL requests and print out frequency reports.

You can also print out a Master Shortwave Log, a listening schedule containing every record in the master file, or a listings by either country or bandwidth.

You can also enter any combination of language, program and broadcasting to codes and generate a listening schedule containing only those records that meet the entry specification(s).

## ☐ Scanbase - For Windows!

**Somewhat similar to PCSW** is the new SCANBASE.ZIP, version 2. This is a Windows program that enhances the use of your scanner radio. (Note that SCANBASE will not run under ordinary MS-DOS but must be fired up in the Windows graphical multi-tasking environment.)

The problem with most scanners is that once you've entered all your active frequencies it is very difficult to remember the details of each one.

This is especially true of the newer scanners that can hold hundreds of frequencies. Well, SCANBASE will remember everything you need to know for up to 200 channels on your scanner. Besides keeping a description for each frequency, the program will assist you in you in figuring out which channels are active and will also keep track of which channels you've got locked out.

Once you have SCANBASE installed on your computer you can run it just like any other Windows program.

The first time you fire it up you will see the sample data from the author's own scanner.

It is a good idea to play around with this sample data before spending the considerable time required to enter your scanner information.

None of the changes you make will be final unless you press the SAVE button or turn on AUTOSAVE. Pressing the RESTORE button will undo any changes since the last save. These seem like good safety features to me.

All of the frequency and descriptive information can be directly edited by clicking on any text box and entering information in the normal manner. The tab key will move you from one box to the next, or you can just use your mouse to select any text box at random.

Red and green indicator lights on the left side of the screen provide a quick indication of which scanner channels you are actually using. By default both lights are off. If you have entered the frequency information and then get a 'hit' on a particular channel, pressing the counter button will increment the hit count by one and turn on the green light.

If you decide to put a channel on 'lockout', you can turn on the red light by clicking on it. A subsequent hit on the same channel will turn the light from red to green.

The counters along the right edge of the screen are used to keep track of the hits on each frequency.

As you listen to your scanner you can press the appropriate counter each time you hear something interesting.

A short period of scoring hits will soon show which of your frequencies are really active and which ones you might want to think about replacing. Most scanners include a search feature that allows you to search through a range of frequencies looking for frequencies you may not already know about. If you are using search mode and don't know if the frequency you found is already in your scanner you can use the SEARCH button to hunt through your database. The SEARCH button is also a quick way to locate a frequency that you already know is in there somewhere.

If AUTOSAVE is selected from the options menu the SAVE button will automatically be activated, as a safety feature, every couple of minutes. If SCAN is turned on you will see a very pretty 'scan' across any activated green lights. This SCAN option doesn't really do anything, says the author, but 'looks very cool'.

Well, at least the guy has a sense of humour! Those of you who have been following ONLINE for some time will realise that both SCANBASE and PCSW seem to duplicate the functions of the popular ever-popular SCANBUF.

This is certainly true. My opinion? PCSW and SCANBASE might suit some folks, and SCANBASE is specifically aimed at UHF/VHF scanning, but I still recommend SCANBUF as the radio database of choice, and SWL115 for writing reception reports. Nevertheless, it may be the SCANBASE has a few unique features that some UHF/VHF buffs find worth investigating, though it's a shame that is only handles 200 channels.

## ☐ GeoClock

**Let's now leave the radio databases** and talk about one of the computer and radio enthusiast's classic programs. GEOCLK45 is the latest update of Joe Ahlgren's excellent GEOCLOCK program reviewed in these pages many moons ago.

It's similar to EARTHWATCH and gives you a real-time view of the earth, as if from outer space, so you can watch our great blue and green planet as it rotates and revolves around the sun.

GEOCLOCK shows the current time (based on your computer's clock) with a high quality map of the earth.

The current sun position is displayed, and the parts of the earth in sunlight and twilight are highlighted. This display is automatically updated every few seconds. Local sunrise, sunset, the sun's azimuth and elevation, and times around the world are also on view.

A variety of map backgrounds and other options are available. An EGA, VGA, or better graphics adaptor and a hard disk are required to run this new version of GEOCLOCK, but the SWP BBS will still keep the older version 4.2 available because it can cope with monochrome displays.

Version 4.5 of GEOCLOCK includes the following features that were not part of earlier versions: a set-up program to simplify the customisation of GEOCLOCK to your location and time zone; maps reflecting the latest changes in the former USSR and former Yugoslavia; and a "screen saver" script that changes to a randomly selected map every 60 seconds (for instance, a world map, a 48 US states map, a north polar map, or a US centred view-from-space map).

## ☐ Morse Code, Anyone?

**Lots of ONLINE regulars** have shown keen interest in the various Morse Code learning programs reviewed here.

For this reason, I thought it might be a good idea if I reminded you that there are a great many such programs available, with slightly varying features.

They're typically quite easy to set up and use and it would be advisable to get them all and try them out, to find out which ones suit your personal requirements.

The latest I've found is MORSE30B.ZIP, a very complete morse code learning program. Others include CW212.ZIP, MCODE.ZIP, MOR21.ZIP, MORSE.ZIP, PASMORSE.ZIP and SM316.ZIP, and I may be forgetting a few in this crowded field! Many radio buffs procrastinating about trying for their Amateur Radio Operator's licence may be doing so out of fear of the infamous code requirement. Well, the new code-free novice will get you on the VHF and UHF bands, but if you want to try your hand at the old HF DX then you've still gotta tackle that morse! So why not give one of these little programs a whirl?

You may be surprised at how slow a code speed is required of you, and how quickly you begin to recognise the various letters and numbers by sound, via your computer's speakers.

It's a great new learning aid and I'll bet you'll find learning morse code more fun than you imagined.

## ☐ Radio BBS Round-Up

**OK, let's finish up** by moving to the world of computer bulletin board services catering for the radio enthusiast.

Well-known SPECTRUM RADIO BBS in Melbourne is still available by telephone and modem 24 hours daily on (03) 819-9167 at speeds up to 9600 bps.

Like my own SHORTWAVE POSSUMS BBS in Sydney, SPECTRUM is devoted to the radio hobby and maintains up-to-date frequency databases and other radio information as well as carrying all these programs reviewed here in CBA.

It should be the first choice for Victorians who want to avoid unnecessary STD charges.

## ☐ New Adelaide BBS

**Those of you residing** in beautiful Adelaide might want to try Graham Smith's PC INFORMATION EXCHANGE BBS at (08) 234-0244.

This system caters to other interests besides radio however Graham receives most of SWP BBS's files and has lots of radio information online 24 hours daily.

Again, it could save some unwanted donations to Telecom! And remember that yours truly works with Prophet Computer Services to maintain SWP BBS radio files (and much more) online at (02) 835-1122, so you really don't have to stand in queue for a single telephone single line anymore.

## ☐ New Sydney BBS

**Sydneysiders might also want to try** out the Radio-Active BBS on (02) 399-9268, a very new BBS with a heavy leaning towards amateur radio in general and packet radio in particular.

There has been steady interest in receiving radio related software by mail from those of you who are (temporarily, I hope) modem-less. So I will continue my 'for a limited time only' special disk offer. Send me up to 6 floppy disks (no more), of any size, plus a cheque for $35, and I will fill your floppies with some really great shareware radio files, suitable for all IBM compatible computers. If there are particular programs you want, just mention their names.

I know the highly recommended SCANBUF radio database, the GEOCLOCK and EARTHWATCH 'grayline DX' programs, and various radio/computer control programs like PROCAT are perennially popular.

But please ask for this service only once, as you will otherwise probably get the same programs all over again!

OK, now here's the legendary address of the ONLINE headquarters for those of you who love stamps and envelopes and all that sort of thing:

***Shortwave Possums BBS,***
***PO Box 357,***
***Round Corner***
***NSW 2158.***

**However, most of you with modems will want to be in touch 24 hours daily via the now-familiar telephone number of (02) 651-3055.**
**As always, your suggestions, questions, praise (and even complaints, in moderation) are welcome.**
**If you want a personal reply, send along a stamped, self-addressed envelope.**

# AR 1500 WIDE RANGE MONITOR RECEIVER RIG REVIEW

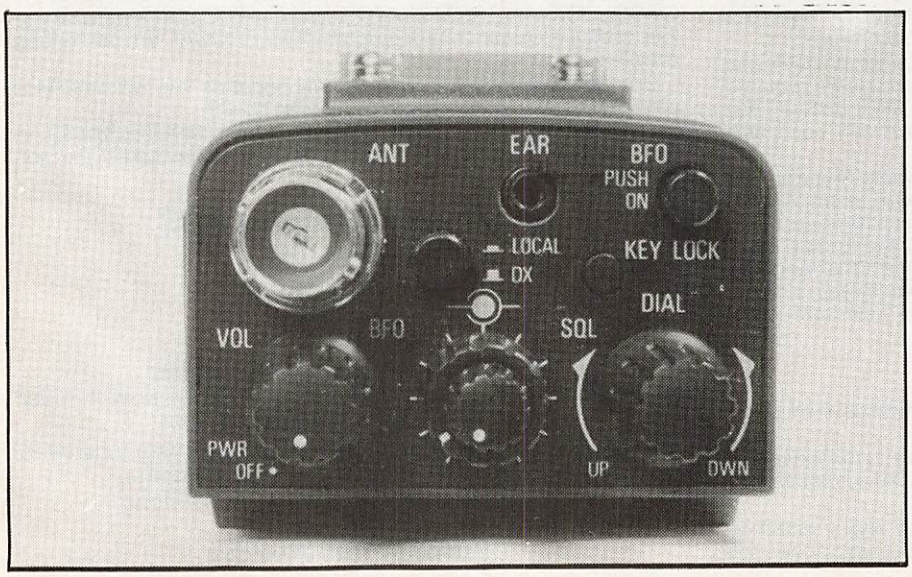
*By Russell Bryant*

I have been writing articles and reviewing scanners in CBA for over five years now. In that time I have reviewed just about every new scanner to hit the market, good and bad. Whilst there have been a few, that as scanners would have made good reenforcing for concrete, there also have been a couple that really impressed me. However, I didn't think I would ever get excited about another scanner again. Without fanfare or fuss the AR 1500 arrives. Based around the popular AR 1000, it is more than I was led to believe.

The AR 1000 captured the imagination of the scanning fraternity with features like, 1000 memory channels, 10 user programmable independent search banks, tri mode (AM, FM, WFM) reception capabilities, frequency lock-out during search, superior image rejection plus many other functions not seen on contemporary scanners. Plus the fact that some of the features of the 1000 were only found in the top-of-the-range base unit, never mind a handheld. Yet the 1000 lacked, what many saw, as an essential requirement -- the resolution of SSB or Single Side Band transmissions.

**AOR stunned the market with the AR 1000, stand by to be blown off the planet with the AR 1500.**

The latest powerhouse of technology to carry the AOR brand, makes the AR 1000 the penultimate handheld scanner. The ultimate handheld has arrived. The AR 1500 has all that its predecessor offered plus much more, including the ability to tune SSB. All tucked away in a neat compact package. The 1500 bears striking resemblance to the AR 900 series scanners, apart from functions and features, the only variation is the raised portion atop the receiver, to accommodate the volume, BFO and other top mounted controls. What does the new AR 1500 have to offer that the others didn't or don't. Frequency limits are 500 kHz to 1300 MHz continuous. There are no gaps. Any frequency within these parameters can be stored in any of the 1000 memories. For easy cataloguing the memory channels are arranged in 10 groups of 100.




**Top panel controls are of a good size - even for people with large and awkward fingers.**

The AR 1500 features an Automatic Memory Function. The 100 channels of bank 9 have been reserved for the storage of frequencies detected during search. To activate the function, simply program search bank 9 with an upper and lower limit. Any active frequency that the receiver locks onto will automatically be entered in scan bank 9. The AR 1500 will resume searching after it has logged the frequency. You don't even have to be there.

Anyone familiar with the AR 1000 will have little trouble coping with the 1500. Programming and operation are identical, as is the function terminology. The inclusion of a BFO for resolution of SSB is about the only thing that sets it apart from the 1000, until you power it up that is.

## IT HAS SOME OF THE MOST ADVANCED FEATURES

The AR 1500 supports some of the most advanced features that scanner technology has to offer. AOR has continued the trend to install EPROM (Electronically

Programmable Read Only Memory) ICs as the brain of the scanners. Once you have programmed the EPROM with data, it retains it until written over or erased. No more lost frequencies when the batteries go flat. Superior image rejection is also a feature of the 1500. The prudent use of 500 and 200 MHz IFs make it possible.

## LOCK-OUT WHILE SEARCHING

Whilst searching out previously unlogged frequencies, it can be annoying having to set the scanner searching again after the receiver has locked onto a birdie or uninteresting user. To overcome the problem, the 1500 permits lock-out whilst searching. Up to 100 unwanted or known frequencies can be removed from the sequence, thereby permitting uninterrupted listening.

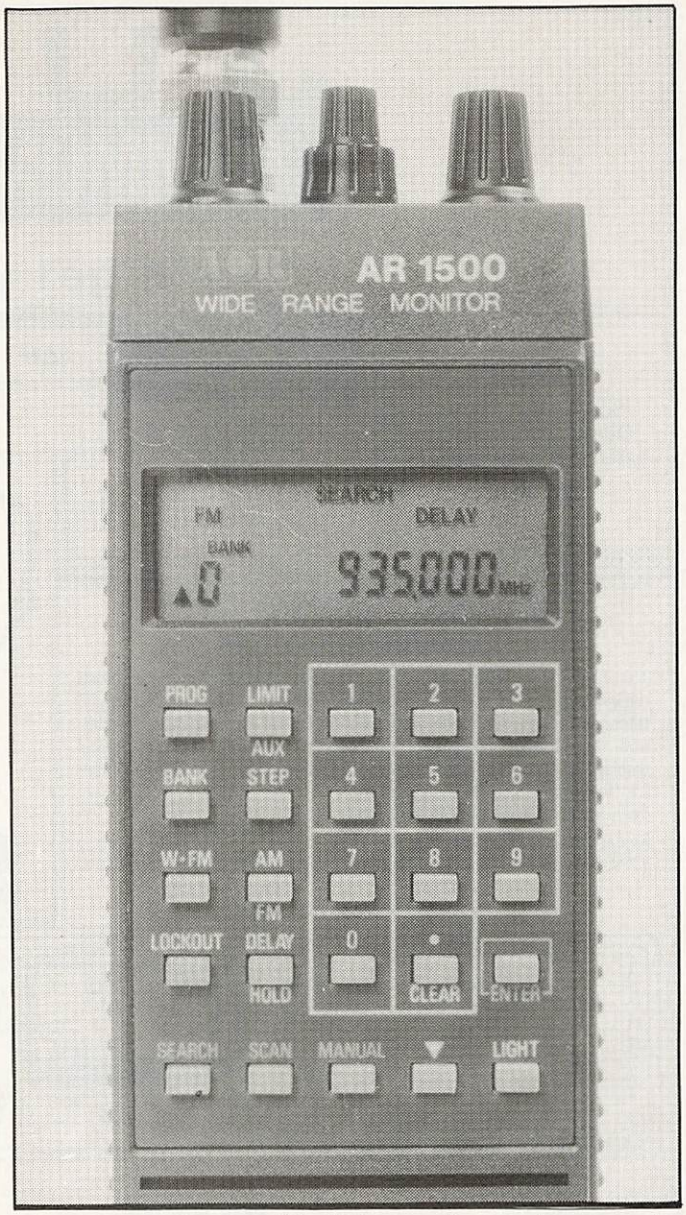
Reception of AM, SSB, WFM or NFM modes can be selected at the push of a button. Single sideband is resolved by using a single rotary control BFO. The BFO is mounted concentrically with the squelch knob. As with its mobile cousin, the AR 2800, the lowest step rate is 5 kHz. The AR 1500 will 'round off' any HF frequencies that don't end in a 5 or 0. With that in mind, the aeronautical frequency 8867 kHz will appear on screen as 8865 kHz. Although 2 kHz off frequency, the BFO is wide enough to cope with the variation. Unlike the 2800 it is easier to resolve SSB because of the single control. Because the AR 1500 remembers the mode as AM, together with the 5 kHz stepping, it is necessary to adjust the BFO each time a new HF frequency is entered into the memory. Whilst this may be seen as an inconvenience, don't forget the 1500 is a scanner first and foremost and should not be seen as a replacement for a dedicated HF comms receiver. Although it would give some HF receivers a run for their money.

Quoted sensitivity figures for the scanner are .5 microvolt or better on FM and 3 microvolts or better on AM. The test radio displayed sensitivity of .25 microvolts on FM and 1.7 microvolts on AM when checked on a frequency synthesiser. Some commercial FM two-way radios cannot achieve figures of .25.

As usual I tested the AOR on a variety of antennas, including an active, a discone and UHF CB high gain mounted on my vehicle. As with most AORs I have concluded that the AR 1500 is best connected to an aerial exhibiting little or no gain. The Diamond D 707 active antenna drives the front end of the radio much too hard, this, together with its sensitivity figures, reduce the effectiveness of the muting circuitry.

## DEFAULTS CAN BE ALTERED

Many receivers, costing more than does the 1500, have factory set search increments, they are often unable to be altered by the end-user. Although the 1500 has default settings that correspond to Japanese band plans, and therefore different to our standards, they are easily altered. If the default is not applicable to the Australian bands, or the search function is too slow, you can skip through the band a little quicker, or alter it completely by changing the channel spacing. The 1500 allows you to dial-up any search step between 5 kHz and 995 kHz in 5 kHz or 12.5 kHz increments. The AR 1500 is driven by the five AA size nicad batteries supplied. The battery life varied from six hours during a heavy scan session, to nearly 12 hours when set on a single medium use (low density traffic) frequency. For use at home or wherever 240 volts AC is available, AOR encloses a power pack. The pack doubles as the charger unit for the nicads. Should all else fail, a pack for four AAA size dry cells is provided as a back-up power source.




The handbook is typical AOR it is meant to be read from begining to end. And it states exactly that within the first few paragraphs. The manual takes the reader on a trip around the scanner. Starting with a description of the controls and functions, it takes only a few minutes to read how to operate the unit, together with its other functions and features. Owners of AR 1000s and 2800s will probably be able to have the 1500 running smoothly straight out of the box.

Included in your AR 1500 showbag is a 12 VDC 150 mA AC/DC converter, DA 100 wideband aerial (a telescoping whip would also be nice), soft vinyl carry case, belt clip, the aforementioned handbook, mobile DC power lead and a very adequate five metres long wire terminated with a BNC plug for HF work.

Before finishing, a word of warning! Enclosed in the battery compartment is a switch. Leave the damn thing alone. Experience should have told me that. The switch totally resets the microprocessor, eliminating ALL functions and defaults settings from the main IC, rendering the scanner useless.

It WILL cost you money to have the defaults reprogrammed into the 1500, unless of course you have a friend in the business.

If I had around $700 to spend, and wanted or needed a scanner for casual sorties into HF, with the versatility of a handheld that wasn't the size of a shoe box, then the AR 1500 has to be just about the best value for money. The AR 1500 is available from Access Communications or wherever AOR products are sold.

# JUST COMMUNICATIONS

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**MARINE**
Sea Dolphin PLUS Quality ZCG marine antenna & swivel base
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**A HANDBOOK FOR THE AUSTRALIAN C.B. RADIO OPERATOR.**
A COMPLETE NON-TECHNICAL GUIDE ON HOW TO OPERATE YOUR SET, WHAT RANGE YOU CAN EXPECT, WHAT ANTENNA TO USE, A.M. & S.S.B. DIFFERENCE ETC.

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SHOWS:
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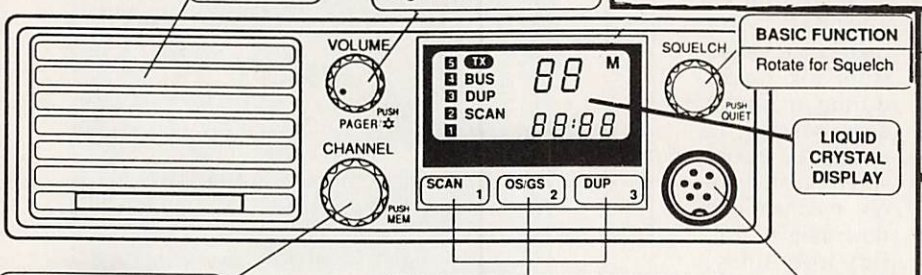
- CHANNELS TO CALL ON FOR FLYING DOCTOR AND O.T.C. RADPHONE RELATED TO TIME OF DAY, SEASON AND DISTANCE TO BASE.
- POINTING ANGLE INFO FOR AUSSAT SATELLITES
- HOW TO PASS EMERGENCY MESSAGES TO TRAIN DRIVERS
- HOW TO FIND SOUTH WHEN THE NIGHT SKY IS A FOREST OF STARS
- PRACTICAL NOTES ON GENERAL REMOTE AREA SAFETY

**$6** AS SEEN ON T.V.

## TX4000 SERIES UHF TRANSCEIVER

The TX4000 incorporates the very latest CADCAM (computer aided design, computer aided manufacturing) techniques to produce a UHF CB transceiver with outstanding specifications and performance. In addition, the TX4000 incorporates amongst other things, a liquid crystal display, fully programmable scanning and a number of innovative signalling features which have never before been available in a UHF CB transceiver.

Remarkably, with all these extras, the TX4000 is now even smaller than ever.




**BASIC FUNCTION**
Rotate for volume ON/ OFF
Press for Backlighting – Bright or Dim

**BASIC FUNCTION**
Rotate for Squelch

LIQUID CRYSTAL DISPLAY

**BASIC FUNCTION**
Rotate to select channels
Press to store channels in memory
Press to SKIP channels when scanning

**BASIC FUNCTION**
Press SCAN to toggle SCAN mode
Press OS/GS to toggle OPEN SCAN or GROUP SCAN modes
Press DUP to toggle DUPLEX mode on Channels 1–8

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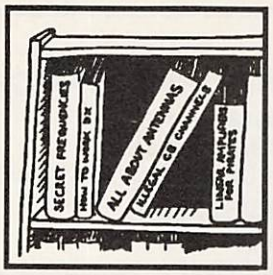
CBA 1292

# AUSTRALIA'S CB SPECIALISTS




# Books...

## "DC To Daylight" Books For The DXer

### The Australian Longwave Radio Guide

From our home-grown Southern Cross DX Club comes this guide to the world of longwave radio, edited by Peter McMillan in conjunction with SCDXC ute editor John Smith.

This 22-page A4 book introduces DXers to the unusual hobby of working the long-wave band. While Australia doesn't use the long-wave band for general broadcasting, as is done in Europe, LW still plays a vital role in modern day-to-day communications. Aeronautical travel would be lost without this band, and with this publication in hand you can experiment with reception of airports around the country.

All major airports and most regional ones broadcast their airport "callsign" in morse code, enabling aircraft to "home-in" on the town, just like a lighthouse shining on the horizon.

A list of non-directional beacons (NDBs) at the back of the book provides an alphabetical listing of airports from around the country with their frequency and callsign. Unlike the shortwave bands, LW has many different propagation properties. This booklet provides a brief explanation of some of these, and also some novel uses for the band.

The London Underground railway relies on LW for communications below-ground, and nuclear submarines use LW to keep in contact without surfacing and so giving away their position.

***The book is available within Australia for $2.50 postage paid, or four IRC's elsewhere in the world.***

***Write to the Southern Cross DX Club, GPO Box 1487 Adelaide, SA 5001.***

### Shortwave - Back to Basics

If you're a newcomer to the shortwave scene then it's likely many of your questions will be answered in "Back to Basics", a new booklet released by the BBC.

In six chapters, this glossy 24-page A5 booklet takes you down the DX path without struggling with any fancy jargon or terms. You'll find several references to the BBC throughout the book (which is natural, since they wrote it!) and about half the book is devoted to particular BBC services, but it's still enjoyable reading. Clear diagrams are used where needed, together with concise and well-written explanations.

This book is a good starting point for the DXer who needs that initial hand-up into the hobby but, doesn't know where to go for help. And the best thing about it is that it's free.

***All you have to do is write to the BBC at Bush House, London, and ask for their "Back to Basics" book.***

**Are you looking for some new books to get your teeth into? Want to find your way around the frequency spectrum but don't know where to start? Rob Williams has a run-down of the latest books available this summer.**

### Proceedings 1992

Just released is this annual publication from Fine Tuning. With more than 200 pages with in-depth reviews of receivers and accessories, and articles on antennas and broadcasting history together with lots more, this book makes interesting reading if you want more from your hobby. For antenna freaks there is a study on RF grounding, and for those who like to reminisce you'll find the discussion on the SW hobby since the 1930s to be compelling reading.

***Price is $US19.50, with surface mail postage $US5 and airmail $US17. Write to John Bryant, RRT no. 5, Box 14 Stillwater, OK 74074 USA.***

### The DXers Guide To The Galaxy

You may have heard of "The Hitchhiker's Guide to the Galaxy" - well, not to be outdone, here's a tour of the top end of the radio spectrum, where radio technology is breaking new ground every day. The DXers Guide To The Galaxy is another fine hobbyist publication from Radio Sweden. Written by George Wood, editor of their popular shortwave program "Sweden Calling DXers" and one who has taken a strong interest in the trend to satellite broadcasting, this guide provides a very accurate listing of satellites available above all continents together with any expected changes.

This includes full details of what you can expect to log on the satellites, together with frequencies and channels. But George doesn't stop there. Military, weather, navigation and earth resource satellites are explained, as well as techniques for monitoring the MIR space station and Space Shuttle. Amateur radio satellites are also given a brief run-down.

Many shortwave broadcasters see the need to provide their international listeners with better quality signals, and are now offering unscrambled satellite signals to anyone who wants to receive them. Unfortunately those of us "down under" don't have access to many of these birds but, things are gradually changing. The arrival of pay TV in Australia will open up new markets for home-based satellite dishes.

Even US hams have made a push to have their own amateur radio relay on US space station "Freedom", which is due for launch towards the end of the decade. George also provides a list of other books and material to read to fill in the gaps. I liked this book very much. I'm not heavily into satellite communications as a hobby, but I like to keep up with new technology. It's an easy book to read and gives an excellent insight into satellite communications.

***And this is a book with a difference . . . not only is it available free from Radio Sweden (S-105, 10 Stockholm, Sweden), but the text has been distributed on the computer bulletin board network for anyone to download and read on their own word processor. The guide is available both on Sydney's Shortwave Possums BBS (02-6513055) and Melbourne's Spectrum BBS (03-8199167).***

# POWER BAND COMMUNICATIONS

**MELBOURNE OFFICE**
**1289 Nepean Hwy,**
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*All second hand goods valued at over $100 carry a six month conditional warranty.*

## RANGER RCI 2950

10 Metre Amateur Transceiver
Ideal for Novice Licence holders

**CW/AM/FM/SSB** with variable repeater offset, scanning, roger beep, 10 frequency memories, 25W PEP etc.
**New issue price $499** plus P&P $20

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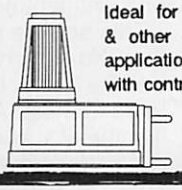

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adds a new dimension to a fantastic receiver. The conversion module is a sub-miniature demodulator employing the latest Surface Mount technology. In SSB mode the SQUELCH control doubles as a CLARIFIER.

**$235** Installed and tested

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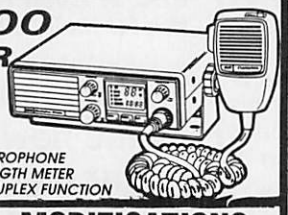

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## NEW...AIR BAND FREQUENCY REGISTER

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Add versatility to your system. Convert your SO-239 (co-ax mount) UHF mount to take 5/16" series UHF and 27MHz antennas.
**$10 plus $2 P&P**

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SAVE SAVE SAVE SAVE

Which heavy duty battery pack BP-7 or CM-96 supplied standard with **IC-40G**
**BP-7 13.2V high power 450 mAH CM-96 8.4V long life 1200 mAH**

***Plus all the usual features:***
- ★ 5 watts output
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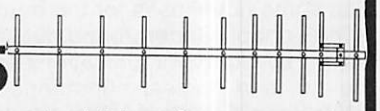
**$29.00 Per Disk Set plus $5.00 P&P**

## PB-11e UHF CB BEAM

Only **$65**



Eleven elements of high performance on a two metre long boom weighing less than 1kg. Low wind loading - 2520 sq. cm. Optimised for forward gain approx. 17dBi. **P&P $15**

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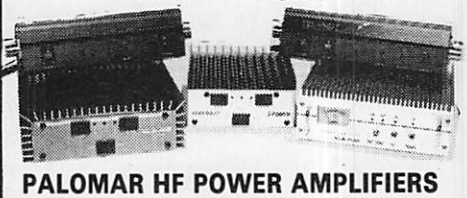

**PALOMAR HF POWER AMPLIFIERS**

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| TX-2250 180 watts PEP 3 power levels RF preamp | $225 |
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| CVS-30 30 watts plus RF preamp | $175 |
| CVS-400 UHF 20 watts plus | $160 |

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# POWER BAND COMMUNICATIONS

**Scanner Fanatics Register 1993 Edition OUT NOW**
**Victorian Register now in stock. $26** **Plus P&P $3.50**

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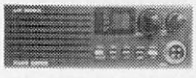
**XMAS UHF Kit**
Comes with cable assy, antenna, & ext speaker.
**Only...**
**$365**

**PEARCE-SIMPSON UF-2020 UHF CB**



Fully user programmable. Loads of features too many to mention here. Ask about the 'tricks'.
**Plus $18 P&P**

**POWER MIKES**
A variety of power microphones available – handheld or base formats. Options include POWER MIKE, POWER with ECHO, & POWER with ECHO and ROGER BEEP etc..
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**3 ELEMENT YAGI FOR 27MHz**
Lightweight construction all alloy-telescopic boom 8.5 dB gain, easy to assemble. Now in stock.

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**ICOM R-100**
**HF/VHF/UHF Receiver**
Covers 0.1 to 1856MHz continuous. 100 mems & many search functions
**$950**

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**PB-1000**
**10dB UHF CB BASE STATION ANTENNA**

PB-100- is a high gain, compound antenna using multiple halfwave elements co-phased for optimum performance.
The high density fibreglass radome employs tapered wall thickness technology to yield high strength, with minimum flexibility and light weight.
The radome is pressure filled with elasticised polyurathane foam for added strength and improved weather resistance.
The low flex characteristics of PB-1000 aids in reducing 'fade and flutter' under windy conditions.
The active elements are DC grounded for static charge protection and minimum 'rain' noise.

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**PB-60 UHF 'SYSTEM' ANTENNA**
PB-60 is a high gain, UHF CRS antenna comes complete with 6dB whiptop and mounting base. Outperforms many similar antennas. Optional whiptops available including s/steel and floppy half waves.
**$65.00**
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In response to many requests we introduce our NEW Phone/Mail Order LAY-BY service for goods valued in excess of $100. From now on you can reserve goods even when you are a bit short of cash. We accept most methods of payment by mail or you can use your credit card by phone in the usual way. Ring for details.

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Please include phone number so we can advise of any difficulty with processing your order. Australia Post will not accept some large items and alternate transport must be arranged. P.O. Box & R.S.D. etc. delivery addresses are not acceptable to private freight companies.

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ALL Orders must include phone number for confirmation.
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## *Catch Those Hidden FM Signals!*

# FM Sub-Carrier DXing – Another Crazy Hobby?

**CBA DX hound Rob Williams is onto something really new -- finding those special broadcasts hidden under your favorite FM radio signal!**

I'm sure you've heard of DXing distant FM stations and using exotic propagation modes to log FM broadcasters from Australia and New Zealand, but have you heard about FM sub-carriers ?

It's a whole new world of DX, and a very hidden one!

### FM SUB-CARRIERS

FM radio has been with us for quite a few years now and we take it for granted, but countries like the US have been listening to FM broadcasts for many years before us.

FM broadcasting uses the band of frequencies in the 88 to 108 MHz segment of the radio spectrum.

On the AM and shortwave broadcast bands the information that is being transmitted is included in the amplitude of the signal -- the reason it is called "amplitude modulation" or AM.

With FM, or "frequency modulation", a variation in the actual transmitted frequency carries the transmitted audio. FM broadcast channels are allocated at 200 kHz spacing starting at 88.1 MHz right up to 107.9 MHz.

Some stations broadcast in stereo, others in mono.

Tuning across the band you'll find the ABC, commercial and public radio catering for everyone's tastes.

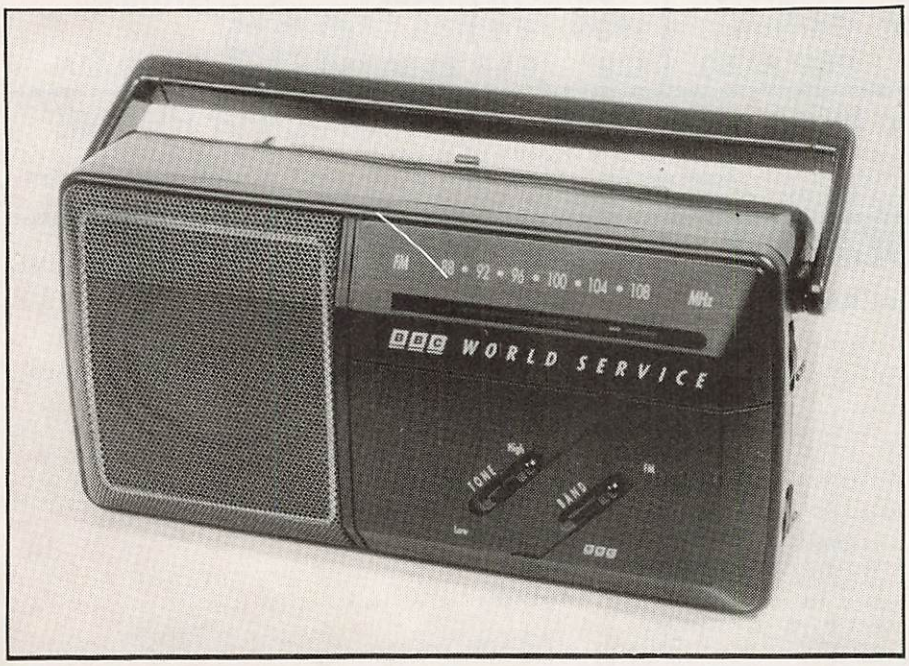
But FM broadcasting offers something that the AM stations can't -- sub-carrier broadcasts.

As their name indicates these are signals which lie under the usual carrier, yet are quite different to the main program. It's like having two radio stations in one, and because ACS (Ancillary Communications Services) can be included in the normal bandwidth of an FM station they make more efficient use of the band.

The technology of FM sub-carriers has been around for many years, in fact well before the FM industry started up here. It has only been in the last few years that DoTaC has cleared the way for broadcasters to use sub-carrier technology to relay additional services.

For a small outlay broadcasters can make full use of the sub-carriers. And for public broadcasters strapped for cash this is an excellent way of raising much needed funds.

***You don't buy the BBC World Service radio - you rent it...now that's different. So also is what you get to hear - broadcasts which you simply cannot receive on a normal receiver.***




### THE TECHNOLOGICAL WIZARDRY

FM sub-carriers are basically extra carriers inserted inside the bandwidth normally occupied by one station.

All an FM radio needs is the right receiver and filters in order to receive these signals. But everything isn't clearcut -- you don't get something for nothing.

Broadcast specialists agree that because you need to reduce your signal deviation by approximately 10 per cent for each sub-carrier you introduce, degradation of the main signal occurs.

You can actually carry up to three separate signals, one with a carrier at 57 kHz, one at 67 kHz, and another at 92 kHz. Data is normally carried on the 57 kHz carrier while the other two can carry a variety of programs.

You may notice that the loudness of your main carrier is reduced by dB per sub-carrier.

You also need to maintain a tight control on your carriers to stop any deviation otherwise you'll have signal splash on adjacent sub-carriers.

### LICENSING

ACS is included under Narrow Band Services by DoTaC, which incorporates several types of "narrowcasting". As an example, the satellite service which broadcasts to pubs, clubs and TABs around Australia is classified as a narrowband service.

On UHF there are multi-point distribution (MDS) services which include broadcasts to real-estate agents, doctors and hospitals and normally require one or two main transmitters on high CBD buildings.

On the VHF high-band are various radio broadcasts, mostly ethnic programs, which can only be received if you have rented a special radio from the broadcaster.

And on the FM band using sub-carriers there is ACS. One example of ACS here in Sydney is the service the BBC operates

as a sub-carrier over 2SER-FM.

## THE BBC STORY

Have you longed to hear the BBC World Service here 24 hours a day without the snap, crackle and pop of shortwave ?

Well, now you can, thanks to the marvels of FM sub-carrier technology and the driving force of the BBC.

You can listen to the famous BBC World Service with nearly studio quality in the comfort of your home. I know what it's like when you try to listen to BBC programs, trying to find the clearest and strongest channel -- well, the BBC and Sydney radio station 2SER-FM have come to the rescue of frustrated DXers.

While the BBC do their best to provide an audible signal into Australia on shortwave they admit they aren't happy with the results.

A recently established service here in Sydney, and soon to be expanded to other capital cities around Australia, enables anyone who wants to hear the BBC to tune in without the expense and hassle of shortwave.

## JUST 40 CENTS A DAY

For a refundable deposit of $50 and just over 40 cents a day the BBC will rent you a special radio which, besides acting as a normal FM tuner, can be switched to the BBC WS transmitted on an FM sub-carrier, relayed live from London.

I might add that for this price the BBC also includes a subscription to BBC Worldwide, the monthly program magazine which keeps you in touch with all BBC programming.

The magazine is sent well before the month starts enabling you to read, digest and choose what programs you want to hear.

## HOW THE BBC GETS ITS SIGNAL TO YOU

For many years now the BBC has been feeding their shortwave relay stations, mediumwave outlets and numerous broadcasters via satellites.

AOTC receives the digital signal off the satellite at one of its earth stations and it's fed to a 2SER-FM transmitter inside Sydney's University of Technology building at Ultimo. Here it is modulated with a sub-carrier and then fed into the transmitter along with 2SER's main signal.

## IT'S AMAZING TECHNOLOGY

The BBC Sydney office kindly loaned CBA one of their World Service radios and it's surprising how clear the signal is -- I sat there listening to news, sport, current affairs, as clear as if I was right inside the BBC's Bush House studios. It really is amazing technology.

You can even hear the announcers operating switches as they talk.

Listening to World Service music is crystal clear. It added another dimension to my radio experience and I found myself listening to more BBC programming than I usually do. World Service news became a must, and as world events happened I made sure I tuned into London to get all the up-to-date reports.

It sounded strange hearing a time check of 0300 GMT while I sat in my office -- imagine listening to the BBC during the day, you would be lucky to hear them at all!

Even at my home, which is well to the south of Sydney, there was a little noise and "splash", but that didn't deter me from listening to the wide range of BBC programs.

## THERE'S A LARGE SELECTION OF PROGRAMMES

With a copy of the BBC Worldwide in hand I was able to pick and choose from the large selection of BBC programs they have to offer.

I expect cricket, tennis and especially soccer fans will rush to sign up for this service as the BBC carries a wide range of sports programs.

But most of all their news and current affairs reporting is second to none. Response to this new service has been good.

The BBC Sydney office knows of journalists, professionals, and ex-Brits who have signed up for the service just to hear London calling!

## A SMALL PACKAGE BUT IT WORKS WELL

The receiver looks like a stock-standard FM radio one would buy anywhere. It's very light and comes with a 240v power lead, but can also run on four D-size batteries.

One can plug an earphone into it for either personal listening or to feed the signal to a tape recorder for playing back at a later date.

There is also an external antenna socket, located on the back of the radio, which allows you to plug in a more elaborate antenna system for those of us who need more signal.

A large tuning dial allows you to receive your favorite FM station, but by flicking a switch on the front of the radio up comes the BBC.

While FM is generally restricted to line-of-sight the location of 2SER's transmitter gives very good results over most of Sydney.

Reception is available from south of Campbelltown, west to the Blue Mountains and north to areas around Gosford.

## WHERE TO GET IT...

If you are interested in subscribing to the service you can contact the BBC in Sydney at (02) 331 7744 or write to them at Suite 101, 80 William Street, Sydney 2011 for full details.

In Melbourne negotiations have been going on with 3RRR to provide a similar service to that of Sydney, and it will only be a matter of time before the World Service is available in other capital cities for all to listen to and enjoy.

## WHAT ELSE IS AROUND?

Other sub-carriers known to be on the air include a service beamed to Franklins supermarkets around Sydney.

This is virtually their own private radio station with ads for Franklins and a good selection of modern music. Other ACS services include ethnic language programming.

Technology like FM-subcarriers has only just began to expand.

With Pay TV just around the corner we could see enterprises taking the opportunity to expand the range of "narrow-casting" that is presently available and I'm sure that DXers will be doing their best to monitor them. It will be through the pages of CBA that you'll be kept informed of what's out there to listen to, so keep reading and if you do run across a new service, like the one I've described above, let me know so I can share it with readers here.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# SIMPLEX REPEATER OR INSTANT ANARCHY

*By Ken Reynolds*
*POWER BAND COMMUNICATIONS*

**From time immemorial, history illustrates that invention and discovery always have two distinct aspects - the face of common usefulness and achievement and the 'darker' side of abuse and mischief.**

Here is a DoTaC approved product having the potential for both.

We are talking about Jensen's latest electronic innovation that can transform a lowly CB radio into a full blooded Simplex Repeater with the potential for far reaching effects. Couldn't resist the pun.

Most UHF CB users will be familiar with 'repeater' stations, located at geographically advantaged sites, that act as relay stations on UHF CB channels 1 to 8.

Often called DUPLEX repeaters - because they occupy two different frequencies - these usually automatic devices simultaneously re-broadcast on a second channel the signals received on the matching 'input' frequency. CB repeaters use a narrow 'split' of 750kHz, or, in CB terms, a 30 channel split between input and output channels.

A Simplex Repeater achieves a similar result but by a different intermediate process. As its name implies, the simplex repeater occupies only a single channel for the relay process. Instead of feeding the received signal directly to a transmitter for immediate retransmission, the information is stripped off the received signal and stored (in this case) in a digital memory for re-transmission on the same channel when the repeater senses the incoming transmission is completed.

The Jensen simplex repeater board comes complete with 1 meg of RAM and is expandable to 4 mega-bytes if required. Without getting to the complexities of the device's operation, the length of the stored message and its reproduced audio quality is a function of the sampling rate of the memory. This means that the best quality audio performance takes up the most memory space which in turn means the shortest message time.

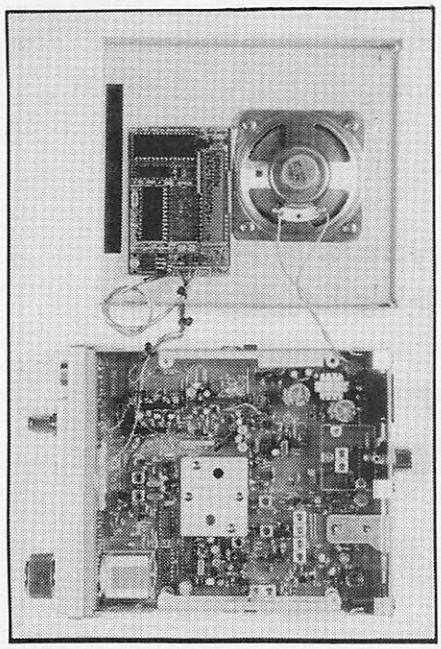
These functions are programmable in the repeater module along with a variety of other features including repeater 'tail' length and beep tones, etc. The longest message time is 262 seconds - that's over 4.5 minutes - using the full 4 meg complement of RAM with the slowest sampling speed. Jensen has researched the project well and the product is executed in a most professional manner. Its operation seems to be free of vices and the reproduced audio quality is excellent with reasonable speech timbre being maintained down to the second last sampling rate setting. The module is compact and fits easily into most CB rigs with room to spare.

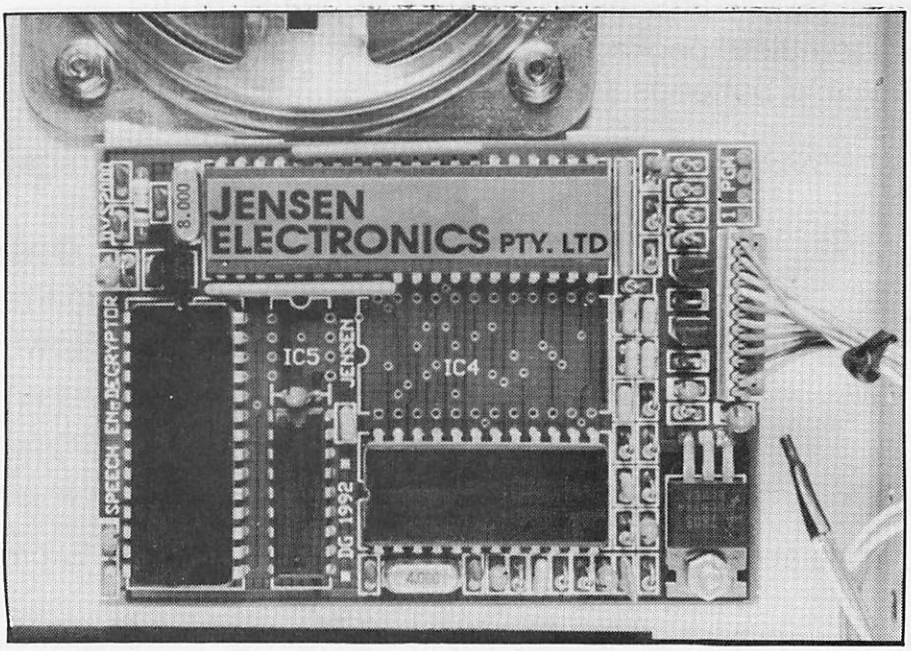
## MOBILE STATIONS ONLY

The type approval certificate authorises the simplex repeater for *use only in mobile stations* and base station operation is excluded. Also, the repeater is *banned from operation on duplex repeater* channels. As we went to press we were advised that the DoTaC now states "Citizen Band Radio Station licences do not authorise the fitting and use of ancillary devices which provide a repeater or retransmission facility. Installations utilising such devices require a different authorisation", *(namely a CBRS Repeater Station Licence - Editor)*. Converting your rig to simplex repeater operation does not produce any irreversible harm to your transceiver as the function is switchable and with the press of a button your normal functions are restored.

The repeater has a wide range of obvious benefits for rural operations, club events, etc. Its uses even extend to search and rescue and the like where a simple CB radio can become the nerve centre for co-ordinating a major operation. In the wrong hands, unfortunately, the simplex repeater has the potential for considerable disruption and nuisance value that we won't discuss further here.

***The 'repeater' module fits beneath the top panel of CB and reviewer Ken Reynolds says that it's well designed, well constructed and works - well.***





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# THE NO-CODE DEBATE AMERICAN STYLE

## FINAL SOLUTION TO NOCODE DEBATE

I sent out the following bulletin a few months ago, but since the code vs. nocode fury seems to have started up again, I am going to resend this bulletin, and I hope all you "debaters" will heed this advice. By the way, the last time I sent it, all the replies I got back supported my solution except for some misguided soul that kept telling me that debate was the spice of life or some such nonsense.....anyway here goes.

With all the argument about NOCODE TECH's pros and cons I thought it was time that I added my 2 cents worth. I have the perfect solution to the nocode debate and all the endless junk bulletins it has spawned on the packet network.

My solution is the ON/OFF switch on the radio.

For those not so technically inclined, many of these are located on the front face of the radio and are accompanied by the word "OFF" at about the 7 or 8 o'clock position.

For those of you not familiar with the clock face, this would be on the lower left side of the knob. Some, like on my Alinco DR-112, are a push button arrangement.

In any case the ON/OFF switch is one of the most reliable and foolproof pieces of equipment around. On the rotary types, just rotate the knob counterclockwise until the detent and subsequent click is encountered.

On the pushbutton types, the stem of the button will stick out farther than when it is in the ON position. In any case, the darkness that will engulf the front panel display will indeed let you know that the device is functioning properly.

NOW.....

When you old geezers on the local FM repeaters hear a new nocode tech, instead of hurling insults and profanities, simply employ the ON/OFF technique. You won't have to listen to the nocode tech anymore, and others listening won't have to listen to your opinion on the subject...(nobody cares what you think anyway), and the women and children listening won't have to listen to your foul mouth.

When you no code techs hear the old geezers badmouthing you on the local repeater, don't key the mike and start hurling insults back. (You know the old saying....don't wrestle with a pig, you both get dirty and the pig likes it).

Simply employ the ON/OFF technique, or at least QSY to another more friendly arena.

When you are tempted to put yet another bulletin on the BBS blasting NO CODE techs,.....STOP!!!! REFRAIN!!!!

Use the ON/OFF technique instead. Like I said, nobody cares what you think anyway, and there will be one less boring bulletin on the packet net. When you are tempted to put yet another bulletin on the BBS defending the rights of NOCODE TECHS....STOP!!!! DON'T DO IT!!!!....

Simply employ the ON/OFF technique. The FCC has already defended the rights of NOCODE TECHS, and by using the ON/OFF technique, you will have generated at least one less dull and boring bulletin for the packet net. Nobody cares what you think either, especially those that are generating the hate mail against NOCODE TECHS.

Now think about it for a minute.

If everybody employed the ON/OFF technique as described above, there would be no badmouthing back and forth between nocoders and extra classes (or whatever upper classman is involved).

There would also be no more of the endless code/nocode debate bulletins...SIGH...what a great life it would be.

Now that I've said my piece, generated yet another useless, dull, and boring bulletin, and since nobody else cares what I think anyway, I am going to heed my own advice and go to work now.

***73 de Tom KA4P***

**Back in 1991, the American governing body of amateur radio, the FCC, introduced a no-code licence.**

**In the early part of next year it is expected that the DoTaC will also introduce a no-code licence.**

**For your interest (amusement ?), we've pulled a selection of bulletins from American amateurs which have appeared on Australian packet boards.**

**We wonder if a similar situation will arise here comes our own no-code licence?**

## NOT ALL OF US ARE BIGOTS

There have been a lot of bulletins badmouthing those with "no-code" licenses. Some are particularly vitriolic, and are an embarassment to most hams. Most of us aren't like that.

Please don't take these boorish oafs seriously. Bigotry and prejudice never makes sense, be it racial, cultural, or in this case, based upon not knowing something that's really not important to know.

Really, folks - CW is fun; CW is historic;

CW can be handy if your microphone breaks (how often does that happen?); but it's really not as important as, let's say, having good communication skills, grammar, being capable of lucidly and accurately expressing yourself (and if you read the packet bulletins, you know how poor many are in this respect!), or being able to properly operate your radio equipment.

Many hams using packet are operating illegal stations, e.g. verdeviating, splattering, out of their subband (do you know where your single sideband is when your dial says you're on the band edge?), etc., etc.

But this is not meant as a critique of grammatical/technical skills.

It's merely meant to bring this stupid anti-nocode bigotry into perspective. It's time to stop the silliness and get down to business.

If you have a problem with a particular individual, take it up with that person. But it's childish to blame an entire group for the actions of a few.

Of course, Hitler got remarkable mileage doing just this; it's really a shame that some folks don't learn anything from history.

I welcome EVERYONE to the wonderful hobby of ham radio. So do MOST "real" amateurs. If I see someone doing something "wrong", I'll offer assistance, not in a chastising manner, but as a friend. It's the least I can do. It was done for me when I was first licensed in 1961.

***73, Mike Curtis WD6EHR***

***(continued over page...)***

# THE NO-CODE DEBATE AMERICAN STYLE

*...CONTINUED FROM PREVIOUS PAGE*

## TO ALL ADVANCED AND EXTRA CLASS LIDS.

Well I am glad to see that the FCC and ARRL conspired with big business to create the NoCode Technician licence.

This gives all you Advanced and Extra Class lids a new lease on life (well at least your amateur life). A new sense of purpose, a new direction, a reason to live!!! What is that you ask???

A license to GRIPE, CRY and COMPLAIN and clog up the packet channels with all your superfluous traffic on codeless techs.

Who died and left you in charge anyways?

Signed "A Tech from way back when and a ARRL life member".

***Carroll - W4NVV***

## WHAT'S THE BIG PROBLEM?

If you guys would use as much effort learning the code as you do arguing about it in these CODE/NOCODE bulletins, you'd have it licked in no time!

***- WD9HTV***

## AW COME ON FELLOWS !!

I have read 100's of thousands of bytes on No Code because my board is set up to hold all bulletins until I have read them and I can't say that I have seen anything but "People Bashing" U.S. wide and this sysop is about ready to KILL any and all bulletins about No Code just on general principle.

At least send them "sp" to the person your mad at and not to the rest of the country - please !!

***73 de Smitty - W0CFY***

## ENOUGH, ALREADY! YOU'RE DEBATING HISTORY

OK, ok. I've seen enough.

You'd think that no-code was a current event you had some control over. In case you CW bigots missed it, the FCC changed the rules LAST YEAR!

No Code Technicians are a fact of life.

So get one! I've heard the arguments - CW keeps out the riff raff, etc. No Way! I was listening to 14.313 around 2020 - 2040Z today and it didn't sound like CW kept some of those folks away. And they weren't no-code technicians, either. Some might not even have had licenses. 28.325 gets interesting, too.

No no-coders there!

How many of you use CW above 50 MHz?

A few. Above 144 MHz? Even fewer.

Some weak signal, satellites and EME and repeaters IDing. And that's about it. Have I ever used CW above 50 MHz?NO.

Granted, I've only been licensed for 4 years and just upgraded from Tech to Advanced in June, but I use CW as little as possible. Why? I don't get a charge out of it.

Others do. A good friend of mine owns a microphone for his HF rig, but each time I talk him into using it he has to take 20 minutes finding it, blowing the dust off and making sure it works.

He lives, eats, sleeps and breathes CW.

Good for him.He enjoys it, he can use it.

Does that make him a better ham than a no-coder? I doubt it. It just means that he can work other stations on frequencies and modes that no-coders cannot.

(He's an Extra Class)

CW ability does not distinguish a good ham from a bad ham. We've got more important things to do with our time than denigrate fellow hams just because of their license class and CW prowess (or lack thereof). If someone is a lousy operator, help him improve. If someone gets a ham license so he can talk with friends on 2 meters while driving to and from work, fine (I spend over an hour a day doing just that).

Enjoy this HOBBY and quit getting excited about how someone got their license (as long as it was in compliance with the rules).

Well, I've gone on long enough. I tend to get diahrea (sic) of the keyboard now and then and I've done it again.

Oops, I misspelled a word and these darned BBS's have no way to edit a line after its sent. Oh well, so sue me!

You no-coders - when in Silicon Valley, check in on 440.150 + (100 Hz PL), the W6JKV repeater, operated by the Tandem Radio Amateur's Club (TRAC).

We welcome all classes (except NOVICE, sorry about that) on 14657 - the machine and won't even ask whether you know the code or not. It's not important on 70 cm. Let's discuss things of more importance than CW/No CW licenses and enjoy amateur radio.

***73 Ghery S. Pettit, N6TPT***
***President, TRAC***

## MESSAGE TO NOCODE LICENSEES

This is a message to all of you hams out there who received their license without taking the code..

I passed my novice exam with code in the early part of 1988, then 2 weeks later I took the technician test and passed 100 %...since then I have been struggling with the 13 wpm for 4 yrs. Now..a lot of the people I have met thru ham radio have passed their exams and now they range from General to Extra class.

I am the only one left that has not upgraded and I want to tell you is that I'm not treated the same as I was before they upgraded.

It's a shame to be treated like this..my occupation is a audio/video electronic service technician. So I'm not stupid.

I just want to tell you what I'm going thru..and that I understand the problems that have arisen thru the nocode procedure.

Hang in there and good luck.

***73 Joe - N8JYO***

## LOOK AROUND

Hello all,

First off, I want to apologize for my bad grammer and spelling. I guess I'm just stupid because I'm not an English major and don't run my messages through a spelling checker every time I sit down at my hobby which I though I was doing because I enjoy it.

After all, no one pays me to write...

I am not against the No-Code class license. I do support it to a point, but, we all have to be careful and as its been so well put, help the new people along.

It's also been pointed out that not only can't I spell, but that I am only a low life Advanced class license holder. (I hang my head in shame and worship the gods with Extra Class licenses.

I'm getting side tracked here...

Some years back, 11 meter CB required a license. Things seemed fairly good until it became a fad type thing. If you were cool, you drove a Trans Am, had a cowboy hat, and had a CB. CB grew like wildfire, FCC no longer could control it, they de-regulated it. No license, everyone then had one.

Now that's not good enough...

Since the dropping of license requirements, came the big boom of "free-banders". These CB operators began regulating themselfs, or lack of, and now cram frequencies between 26 MHz and 28 MHz (+ - several MHz), or however far they can make their rigs change frequency and their 2 KW amps can handle without too much TVI within a 10 mile area.

This is the "type" of rotting I fear "COULD" happen to our hobby if we don't take care of what we have. I'm not saying that people don't have the right to request priviliges through the legal system, I'm not saying that no-coders, as a whole, will be the cause of this.

I'm simply saying, if enough people raise a big enough stink (no matter who they are), we can all kiss our hobby and the respect the ham gets from the general public (assuming they even know what we are) goodbye.

Its happened at least once.

11 meters is useless as a communications band/mode unless you are talking car to car within eye sight.

The global communications we enjoy, yet not without flaws, will become an extention of the "free-banders" dream, and the FCC will mop up by selling bands, fines, etc, while the "free-banders" use 1000 watts of splatter to talk a state or two away on "our" bands...

Think about it and quit flaming everyone because they spelled a word wrong or that you fear someones rights to screw up a good thing may be taken away.

***Mark, N8LHG (Low life bad speller and only an advanced class scum ball).***

## WHO REALLY OPPOSED NOCODE ?

I had originally intended to title this bulletin "EXTRA CLASS OPERATORS MUST DIE" ....why ?

Because all the pro-nocode bulletins I read seem to intimate that the only people who are trying to impede social progress are those slimy, racist, sexist, homophobic, mur-

dering, potty-mouthed jerks who hold an Amateur Extra class license.

I hear tell that all you have to do is to tune into any QSO on 75 or 20 meters (the most often referred to places that these hate mongers hang out) and you will be treated to the worst possible examples of humanity known on this planet.

GIVE ME A MAJOR BREAK !!!

There may be a slight case of sour grapes here BUT let me get to the point of the title of this message: MOST of the hams I have encountered who were opposed to nocode were NOT extras, advanced, or even generals.....they were TECHNICIANS !

The most often heard comment was "I had to learn 5WPM to get on this repeater and I think everyone else should have to also."

There I go again.....I just had to open my big mouth and invite the wrath of billions and billions of bytes of hate.

Oh well, if you can't stand the heat then stay off the keyboard I guess.

73 to ALL hams regardless of "class" of license - from one of those awful guys.

***Mike - W9OJ***

## SIMPLIFIED AMATEUR LICENSING

To what end is W5YI's proposal?

It would appear that the main result would be the elimination of the Extra class.

Why?

I believe it is an excellent opportunity for those of us who value achievment. There is really little to be gained withthe Extra license except the personal gratification of achievement.

In fact I would personally like to see another higher grade added with an even tougher test and code at 35 wpm. Now that would be an achievement, and who would it hurt? For that matter, who is being hurt now with the current test requirements.

I submit that it only hurts those who want something for nothing. I believe that a great part of being an amateur radio operator is the pride of achievement. If you make it easy it loses its value. If you lose the value then the hobby will deteriorate.

Come on people its not that hard. There are pre-schoolers with licenses, yes with code! I really believe that the people who are complaining about the testing are a small minority, albeit a vocal minority.

I wonder why we hear all this complaining from people who seem to want to join us? When the first thing they seem to want is to change what we are.

If they don't like us the way we are why are they so anxious to join?If all you want is to talk to someone, why not get a cellular phone and talk to your hearts content. It would probably be a lot cheaper in the long run. You won't have to fight with the spouse about leaving them out. You won't have the neighbors trying to run you out of town because your interfering with their television, telephone, stereo, etc. You won't be fighting with zoning regulations over your antenna. And there is no test!

You can add a modem and connect your computer to millions of other computers all over the world without having to put up with delays through crowded nodes. The advantages go on and on and on.

Meanwhile would you mind letting us serious hams do what we are licensed to do and quit trying to convince us that we are your enemy. We aren't!

f you want to join us the path is simple and we will welcome each and every one of you with open arms.

***73 Dick - AA7NI***

## HF..TECHS..AD NAUSEUM...

I have been seeing a number of bulletins lately regarding HF privileges for Technician (No Code) licensees. I'm probably asking for a ton of hate mail, but don't clog up the national packet system with it, because I probably won't bother to read it.

I see a couple of disturbing things in these bulletins, and I think that someone needs to clear up a few points.

*a) Who determined that HF privileges require code proficiency?* Just as the FCC governs communications within the United States, the ITU (International Telecommunications Union), a United Nations organization governs international communications. HF communications do not respect international boundaries, therefore the ITU has authority over them.

The ITU is the organization that has said that we must exhibit code proficiency to operate below 30 MHz. Since we are a member nation of the U.N., we must comply with this directive.

Until very recently the ITU required that all ship board radio operators (Communications Officers) had to have a proven proficiency at the international Morse code of 25 WPM.

This requirement was recently dropped.

It is very likely that the requirement for amateur code proficiency will be dropped in the near future. Until then, code proficiency tests for operating below 30 MHz will be the standard. These proficiency tests may take a different form, but they will remain.

*b) Code is Dead.*

On the contrary, there are still hundreds of thousands of Hams worldwide who use the code for communications.

I recently worked the ARRL November Sweepstakes, CW Weekend. Towards the end of the contest I heard many stations giving reports that indicated that they had made over 1,200 CW contacts in a 30 hour period.

That's 1,200 contacts with DIFFERENT operators. I only worked about 5 hours of the contest, but made 120 contacts.

CW is relaxing. When I've had a tough day at work, I find it very comforting to sit down at my station and "pound brass."

It is very hard to think about the fight with the boss when you're concentrating on a stream of dits and dahs.

As many Technicians are finding out as they become Tech-Pluses, CW is not hard to learn, and it can be a lot of fun when you stop belly aching about it.

*c) No-Code is a valid licence.*

There is no such thing as a "No-Code" licence. It is called the Technician licence and it, along with the Novice licence is intended to be an entry level ticket.

***(continued over page...)***

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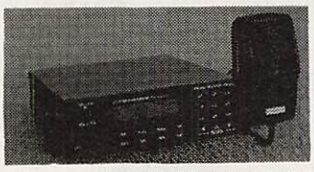

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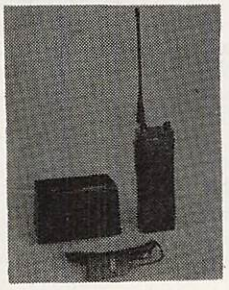

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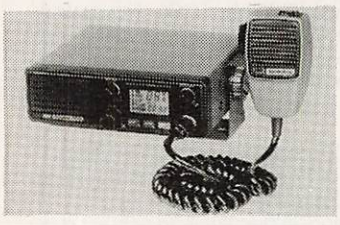

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# THE NO-CODE DEBATE AMERICAN STYLE

*(CONTINUED FROM PREVIOUS PAGE)*

Novices can move up to Technician-Plus by taking a second (element 3A) theory test and Technicians can move up to Technician-Plus by taking a (Element 1A) 5 WPM code test. The intent is not to let people come into the hobby at the lowest and easiest level, just to have them stay there.

The intent should be to have folks upgrade their licence classes. My personal opinion is that the first ticket a person receive sshould be a short term (say 12 month), non-renewable licence. This would require an upgrade within a reasonable time for a renewable licence to be issued.

*d) The No-Code license is here to stay.*

One thing that Hams have discovered in the last several years is that nothing is permanent. If the no-code experiment proves invalid, the FCC has the capability to change their minds.

There were many promises and predictions made to convince the commission of the need for a codeless licence class. They were promised that thousands of technically minded computer types would rush to obtain the licence. This has not happened.

They were promised that the ranks of active amateurs would swell.

This has not happened (most are getting into the hobby without getting involved in public service, emergency nets, etc.)

They were promised that the new Hams would buy more equipment, providing the base for greater gear development.

Except for HTs, this isn't happening.

If some of these promises don't start to come to pass, there may be some more surprises coming at the codeless licence class from the Gettysburg address.

Most Technicians (No Code) of today are people who would have learned the code in the past to get their tickets. I can't say that I blame them for wanting to take the path of least resistance. No industry ever raised its standing by lowering its standards.

***73 de Tom - AA6MZ***

# HOW TO REPAIR AN ELECTRONIC INSTRUMENT

**By N7ZEF**

*Step 1 - Approach the ailing instrument in a confident manner. This will give the instrument the mistaken idea that you know something. It will also impress anyone who happens to be looking, and if the instrument should suddenly start working, you will be credited with its repair. If this step fails to work, proceed to step 2.*

*Step 2 - Wave the service manual at the instrument. This will make it think that you are at least familiar with the source of knowledge. Should this step fail to work, proceed to step 3.*

*Step 3 - In a forcible manner, recite Ohm's Law to the instrument. (Caution: Before taking this step, refer to some reliable handbook to be sure of your knowledge of Ohm's Law). This will prove to the instrument, beyond the shadow of a doubt, that you know something. This is a drastic step and should be attempted only if the first two fail. If this step fails to work, proceed to step 4.*

*Step 4 - Jar the instrument slightly. This may require anything from a three to six foot drop, preferably onto a concrete floor. However, you must be careful with this step because, while jarring is an approved method of repair, you must not damage the floor. Again, this is a very drastic step. If it fails, proceed to step 5.*

*Step 5 - Brandish a large screwdriver in a menacing manner. This will frighten the instrument and demonstrate your knowledge of the deadly "short circuit" technique. Proceed to step 6.*

*Step 6 - Add a tube...Even if the instrument is solid state. This will prove that you are familiar with the instrument's design. This will confuse the instrument and thereby increase your advantage. If this doesn't work, proceed to the most drastic and dangerous step. It is seldom needed and is a final resort if all else fails!!!*

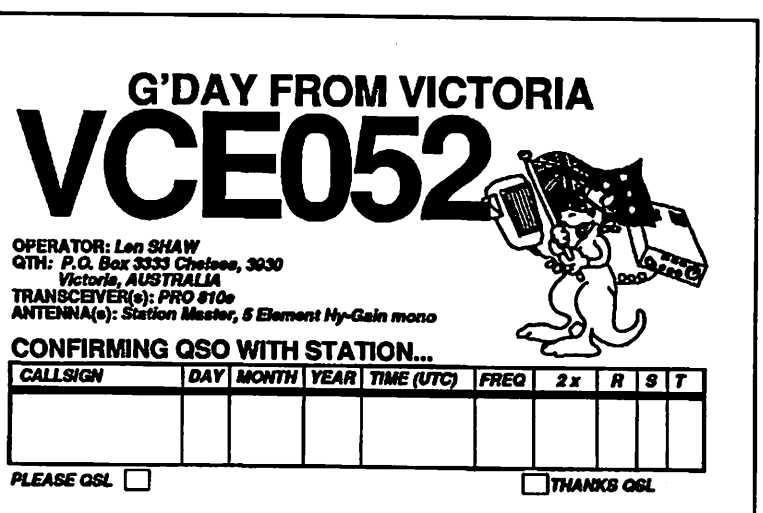
Step 7 *T*H*I*N*K*...!!!

# QSL CARDS FROM BINT SERVICES

**Bint Services have been supplying QSL cards to CBers and amateurs for many years and the one to the right is an indication of what you receive for your money...the actual quality is considerably better than this reproduction ! It contains callsign, name, QTH, rig and antenna details, logo, plus of course the essential QSO panel. The cards are competitively priced and turn-around time is about 14 days from receipt of order to delivery of cards.**

**Similar cards, but without a design logo, are also available at less cost and there are also pre-printed, multi colored cards at varying prices. For some samples and prices, drop a note to:**

***BINT Services, P.O. Box 323, Cheltenham 3192 and please enclose a 90 cent stamp to cover return postage.***



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# hf utilities

*with Richard Jary*

*WHERE TO LISTEN and WHAT'S BEING HEARD*

**By the time you read this I should have returned from my Cambodia trip, and what a way to go - a nice flight with Qantas to Bangkok, then over to Phnom Penh with Thai International and around the country in military choppers!**

This is all in order to set up a network for the United Nations, much of which consists of HF radio links from the more remote parts of Cambodia. At this time I don't know the frequencies to be used - one problem is that Cambodia lacks an equivalent of DoTaC, so nobody really knows what frequencies may already be in use over there!

## » Kiwi Communications

**Reasonably close to home** I've got hold of some New Zealand frequencies from Paul, who lives in the land of the long white cloud.

Weather reports from Mountain Radio can be heard at 0630 and 0730 UTC on 3345 kHz for the North Island, and 3261 kHz for the South Island. A couple of transport companies that use HF are Johnson Brothers on 3348 kHz, and Liquigas on 4865 and 7849 kHz. QANTAS control has 10078, Mt. Cook Airline Control on 3131 and 4697, Ansett New Zealand on 5704, and The Helicopter Line on 5411 kHz.

## » US Hurricane Frequencies

**Over in the United States** various frequencies are used for tracking purposes during their hurricane season. The Coast Guard ground to air frequencies are 8984 and 5692 kHz, and the NOAA hurricane hunter aircraft that fly into the middle of hurricanes - not my idea of a fun job - use 13267 daytime and 6673 kHz nighttime as their primary frequencies.

## » NSW Police on HF, too

**Most CBA readers** listen to their state police on either the UHF or VHF bands, but there's much activity below 30 MHz from the boys (and girls) in blue. Patrick McDonald, SWP BBS sysop and possum chief extraordinaire, has reported that 2630.5, 3752, 4557, 7657, 10505, 13730, 14572 and 18542 kHz are all used for communications with other states. For internal NSW use, try 3252, 4560, 6905, 7660, 10505, 13730 and 17675 kHz. Liaison with ACT and Victoria occurs on 4780 kHz, and a couple of other allocated frequencies are 5180 and 5915 kHz. I don't have listings for the other states - if anyone has these please let me know.

## » Military Monitoring

**Another one** of our intrepid editors, Rob Williams, had passed onto me news that British Intelligence Agency MI6 is closing its monitoring station at Kuwandi, 30 km north of Darwin, in early 1993. It is situated next door to the Department of Defence station HMAS Coonawarra.

MI6 and ASIS jointly operated the relay from June 1968 and it has operated ever since except for two days after Cyclone Tracy.

By 1984 Kuwandi was operating on 32 frequencies with the callsign VJW and occupied 800 hectares of bushland. Kuwandi was used to train Australian Defence staff in communications techniques for special operations, as well as relaying information from diplomatic stations in the Far East back to London. It is the last British relay station in the world for this type of work. ASIS, the Australian Security Intelligence Service, also operates stations in ten countries, including Japan, Philippines, and Egypt.

## » Search and Rescue

**Last month Shane from Western Australia** asked for some RAAF frequencies used for coastal search and rescue missions, following a number of recent problems with sinking cargo ships and the like. I've checked through my lists and talked to Russell Bryant, and unfortunately haven't found a great deal. This is partly because the RAAF isn't usually involved in rescue missions unless they are sufficiently far off the coast for domestic rescue services to be unavailable.

I would suggest normal RAAF frequencies would often be used, these could even be via satellite nowadays.

An Australia wide distress channel that may be used is 5695 kHz. Western Australia is listed for 7657 kHz and 7660 kHz, the latter is also a police channel and may be used for coordination.

The Marine and Harbors Department uses 2112, 2182, 2524, 4125, 4535, 4620, 6215, and 8294 kHz.

Recently there have been a number of boatloads of refugees arriving in Australia seeking asylum form Asia, or even Europe via Papua New Guinea, which seems like going a long way just to live in this land of hope and opportunity (has anyone lately reminded our politicians of that this is the land of hope and opportunity?).

These refugee boats are spotted by Coastwatch planes before being intercepted by Navy vessels, unless they make landfall first. Our Coastwatch service is contracted out by the government to a private company. Unluckily nobody seems to have to a list of specific Coastwatch frequencies, however it is likely they may use Customs frequencies. These are listed as 2148, 5285, 7690, 7960, 10435, 13591, and possibly 13780 kHz.

Otherwise you could hear the aircraft on the standard international and domestic air traffic control frequencies, though I suspect they would just use a callsign indicating the plane's registration letters. Apparently the Coastwatch service is rather a private affair.

I've had a bit of feedback on the Radfax decoder, and have yet to find anybody who has successfully made this unit work on RTTY.

I guess at this stage we'll have to put that part of the unit down as inoperable. Lastly on this topic, I've had a request for some reviews of RTTY decoder units, if anyone has a good one they would like to recommend then I'll try and get hold of one for review purposes for a future edition of CB Action. And that's about it for another HF Utilities.

Last month I mentioned a possible Contacts section, if you want to make contacts then drop a line with an address and a brief idea of your interests. If you've already done so, don't worry - I'll include them next month. I'm typing this a bit early due to the Cambodia trip so some mail won't have arrived yet!

***The address to mail to is:***
***Richard Jary, P.O. Box E160, St James, NSW 2000***


# SCANBOOK

As reviewed in November/December edition of CB Action.

| TX | Comments | User | RX |
|---|---|---|---|
| 476,375 | _____ | _____ | 477,125 |
| 476,400 | _____ | _____ | 477,150 |

**UHF CB 40 Channels**

| TX | Comments | User | RX |
|---|---|---|---|
| 476,425 | CB | UHF CB CH 1 | 477,175 |
| 476,450 | CB | UHF CB CH 2 | 477,200 |

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# dxlogbook *with Rob Williams*

WHAT'S HAPPENING IN THE WORLD OF SHORT WAVE RADIO...

**Well, 1992 is just about finished and it sure has been an exciting year for DXers, what with broadcasters queuing up to use CIS transmitters and all those station name changes.**

**But other events need recording in the DX history books too - just one of which were the large amounts of religious broadcasters coming out of the woodwork in the USA.**

**Well, you can be sure that 1993 will be an active year where more broadcasters will face financial crisis, we may even see some disappear.**

**Now, on with the column. As always all times are in UTC and all frequencies are in kilohertz.**

## ☐ Calling All DXers

***Like in Russell Bryant's*** SCAN column from time to time I'll publish addresses for anyone looking to directly contact fellow DXers.

If you would like me to print your address just drop me a short letter. To start this off here is our first contact:

*Jim Scott, 48 Hurt Parade, Unanderra NSW 2526*

Jim is not only into shortwave broadcasting stations but also utilities, so if you live in the Wollongong area drop him a letter. Jim is also after a manual for the Trio 9R-59DS he brought recently.

## ☐ RCBS Activity

***In conjunction with Swiss Radio,*** The Red Cross Broadcasting Service provides listeners around the world with an insight to the various operations of the Red Cross.

Their English language program "Red Cross Review" airs on the last Thursday of each month to Australasia, NZ and the South Pacific at 0915 on 9560, 13685, 17670, 21770, 9560 and 17670; also at 1115 on 13635, 15505, 17670, 21770, 13635 and 15505.

## ☐ Radio Finland Updater

***Finland uses six transmitters*** located at the small Finnish town of Pori, ranging in power from 500 kW to 100 kW, and they manage to cover most parts of the world. English from Radio Finland to 28/3 /93 to Australia and Asia is heard between 0900-0925 on 17800 and 21550, 0925-0955 on 17800 and 15245 and from 2230-2250 on 11755.

## ☐ English From Polish Radio

***Effective to 3/5/93,*** Polish Radio in Warsaw has English programs as follows: 1300-1355 on 6135, 7145, 9525 and 11815; 1600-1655 on 7285, 9525 and 11840; 1800-1855 on 7270 and 9525; 1930-2025 on 7270 and 9525; and finally 2030-2125 on 6095, 6135, 7145, 7270 and 9525. Subtract one hour from these times after 28/3/93 due to daylight saving changes.

## ☐ Catch Egypt On Shortwave

***The Winter English schedule from Cairo***, according to Andy Sennitt from WRTH, to South East Asia is 1215-1330 on 17595.

## ☐ More Name Changes

***The latest station*** to change its name is Belgium BRT. Their new name is Radio Vlaanderen International (Radio Flanders International). Their latest sked to 27/3/93 has English on weekdays at 1000-1030 on 17550 to Sth East Asia.

## ☐ Changes At Radio Czechoslovakia

Radio Czechoslovakia is also expected to change its name on January 1 to Czech and Slovak Radio International. English broadcasts include: 0400-0430 to the Middle East and South Asia on 11985; and at 0730-0800 to Asia and the Pacific on 21705 and 17725.

## ☐ New Equipment Buyers Guide

***I've just received news*** from the offices of the World Radio TV Handbook about a new publication hot off their printing presses. Called the WRTH Equipment Buyers Guide, it's crammed full of receiver reviews as well as the latest active and passive antennas on the market.

But they haven't stopped there - there's also information on computer software and several articles devoted to the pleasures of shortwave listening.

Response to a survey in the 1992 edition of the WRTH called for a reference book to guide them towards buying a shortwave receiver.

Grabbing the opportunity, the services of Willem Bos and Jonathan Marks were quickly put into action to produce this book's 260 pages of reviews and associated material. The book is to be priced at US$19.95 and looks like being another successful book from the stables of the WRTH. As soon as I have more details on local availability I'll let you know, but it seems that for anyone who is interested in buying shortwave hardware this book will be a must.

## ☐ World Of Radio Broadcasts

***With the ending of daylight saving*** in the northern hemisphere, US shortwave stations adjust their broadcasts accordingly. Glen Hauser's World Of Radio has weekly broadcasts over WWCR and WRNO and these now air as follows: on WWCR Friday at 2215 on 15690, Sunday 0405 at 7435, Monday at 0000 on 7435 and again at 1330 on 15690, and Tuesdays at 0730 on 7435. For the WRNO broadcast try Saturday at 2300 on 7355, Sunday at 0300 on 7355 or at 2130 on 15420.

## ☐ Latest Sked From Israel

***Kol Israel*** has a new sked effective to 27/3.93: English is heard at 1400-1425 to Australia and Asia on 15650.

## ☐ Impressions On BBC Worldwide

***It seems that many DXers*** aren't too impressed with BBC Worldwide, the new magazine which has replaced Waveguide. Several comments on worldwide shortwave electronic mail systems indicate that BBC fans felt they were wasting their money subscribing to Worldwide, with Chris Morison describing it as "like one of those magazines you get when you fly on an airplane". I have to agree with him - for the money it costs Aussie DXers you would get better value joining a DX club or on buying other DX publications.

## ☐ BBC Now On Air From South Africa

***While on the subject*** of the BBC their new relay arrangement with SABC has began. English is carried from 0700-0730 on 17790 using 50 kW and 1700-1900 on 15420 with 250 kW.

## ☐ AWR-Asia Recovers From Typhoon

***August 28th was a date*** that AWR staff won't forget in a hurry! Typhoon Omar swept a path of destruction through the tiny island of Guam, and an estimated US$90,000 damage was

done to the station forcing it to rely on one transmitter for several months. Their new sked effective to 28/3/93 is as follows.

English 0100 on 15610, 0200 on 13720 Sat & Sun only; 1600 on 11980, 1700-1900 on 13720 Sat & Sun only and 2300 on 15610. DX Asiawaves is aired at 0215, 1615 and 1815 on Sundays and again on Saturdays at 1615 and 2315.

## ☐ DXers Catch St. Helena On Shortwave

***A rare opportunity*** gave Sydney DXers the chance to catch Radio St. Helena on shortwave during October.

With advanced knowledge of their broadcast a small DXpedition to the outer-western Sydney suburb of St Marys was arranged.

Wayne Watts, Todd Emslie, Steve Carr, Michael Rolph and Ian Baxter moved into operation for the first broadcast with a range of three specialised antennas - a dipole cut for 11092 kHz, a longwire some 6-7 wavelengths long and a V antenna with each leg cut to 4 wavelengths and terminated on each leg to ground via a 500 ohm resister and feed with coax via a 9: 1 balun.

Organised with military precision the DX team prepared for the broadcast at 2000, when the station came on air. It started with the BBC World service followed by local news and then live international phone calls were put to air.

Five radios were used: a Sony ICF-2001 and 2001D, a FRG-7700 and FRG-8800 and the Icom R-71a, with the Icom outperforming the other radios. Ian tells me that both broadcasts were heard with the first at near perfect strength.

A letter from Arthur Cushen tells me that while he didn't hear St. Helena at his QTH in Invercargill it was heard by DXers at their listening post at Wainakarua.

The station was also logged by DXers in Melbourne. Nice one, guys - I wish I could have made the trip.

It reminds me of the time I went on a DXpedition chasing the Falkland Islands during the battle for the islands - they can be a lot of fun!

## ☐ World Wide Programming From Deutsche Welle

***The latest English sked*** from Deutsche Welle with English to our corner of the world is 0900-0950 on 6160, 11915, 17780, 17820, 21465, 21650 and 21680, then from 2100-2150 on 6185, 9670, 9690, 9765 and 11785.

## ☐ Swiss Radio Shortwave Sked

***Swiss Radio International*** has the following English sked aimed at us: 0900 -0930 on 9560, 13685, 17670 and 21770; to the Far East at 1100-1130 on 13635, 15505, 17670 and 21770, and 1300-1330 via Beijing on 7480.

To South East Asia between 1300-1330 on 11690 via Beijing, 13635, 15505, 17670 and 21820; also to South Asia on 13635, 15505, 17670 and 21820 at 1500-1530.

## ☐ CSM Updates Sked

***Michael Batchelor*** reports on Internet that the Christian Science Monitor has made some changes to their sked for the W-92 transmission period. Their new sked has the following services aimed towards Australia:

from WSHB on transmitter 1 at 0800-1000 on 13615, KHBI transmitter 2 0800-1000 and 1200-1400 on 15665 and 1800-2000 on 13840.

**Well, that brings to the end of DX Logbook for another edition. If you have any questions or wish to submit info to this column write to me at:**

**PO Box 108,**
**Minto, NSW 2566,**
**including an SSAE**
**for reply.**


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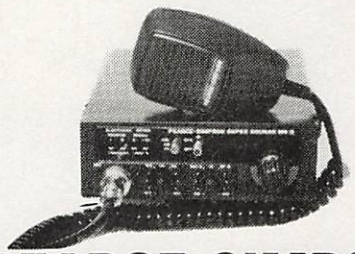

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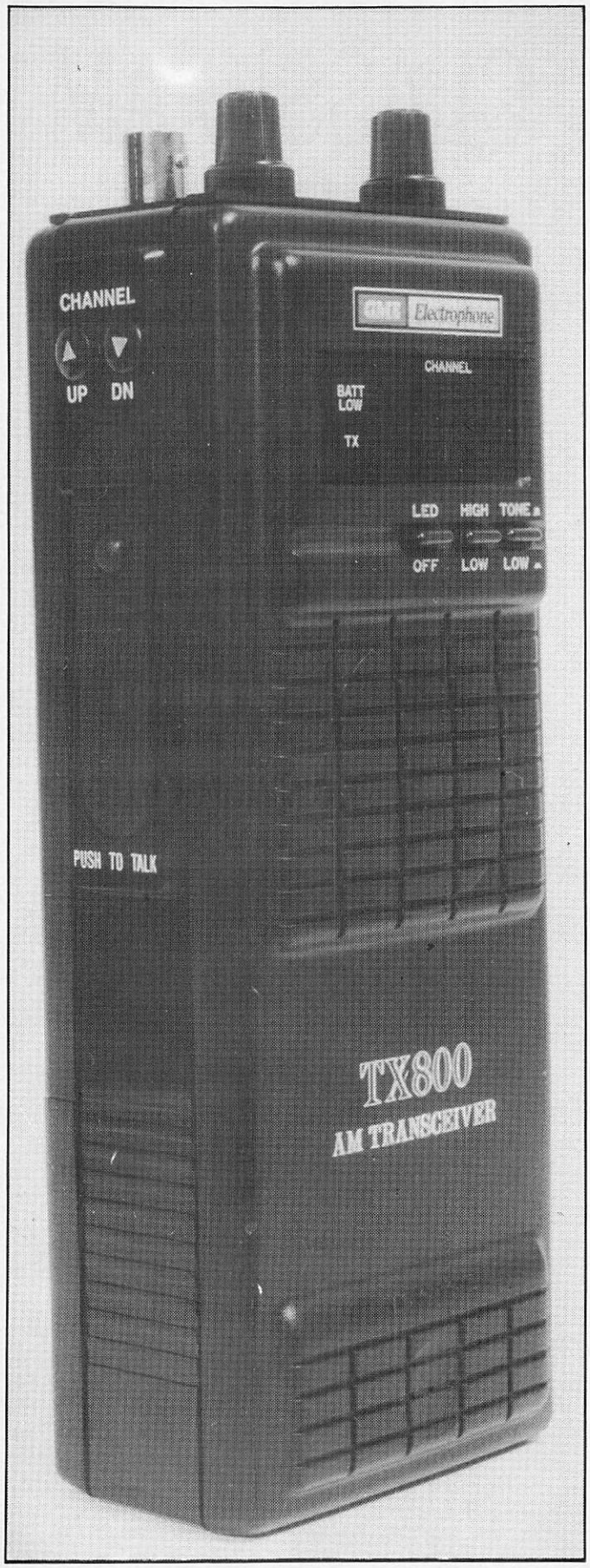


# TX-800 27MHz 40 channel portable

*By Ken Reynolds*
*POWER BAND COMMUNICATIONS*

**I remember about nine or ten years ago talking with Blair Campbell, GME's State Manager for both Victoria and Tasmania. During our discussion we broached the concept of Electrophone producing a 40 channel, 27MHz portable CB transceiver. Blair nodded encouragingly and I trotted off back to the office with visions of a new, 'trick' hand-held employing electronic channel selection and a removable, BNC mounted, 'floppy' antenna.**

Well, like many good ideas, time passed and the image slowly faded into a background of other priorities.

It hadn't crossed my mind for years when, out of the blue, a few days ago I got a call from Blair wondering if CBA would review the new GME-Electrophone 27MHz portable.

So, here it is. A little late perhaps. But I ask you, what's nine years or a decade between friends?

## BIG BY TODAY'S STANDARDS

Model-named TX-800, the new AM only 40 channel 27MHz portable transceiver is compact by 1970's standards (but somewhat oversize by 1992 specs).

The all black plastic unit measures 185mm long by 70mm wide x 48mm deep and with a full complement of AA size cells the total weight is about 600 grams.

The first obvious improvement over most similar units is the lack of the old fragile telescopic style aerial which has been replaced by a flexible, rubberized, helical-come-centre loaded whip measuring 250mm long and attached to the top of the radio with a (BNC) bayonet N type connector.

## KEEP YOUR HANDS OFF

We were a bit cynical about the expected performance of the antenna but it shaped up quite well considering its size. We did a sweep on the spectrum analyser and found it to be well tuned to resonance so long as you keep it well clear of surrounding objects and keep your hands off.

For interest sake, touching the antenna lightly with a hand drops the resonant frequency by a good five megahertz.

Mounted on the top panel is the combination on/off switch and volume control, squelch control and sockets for external microphone and earpiece. The squelch threshold can be set to open on a signal strength of 0.5 microvolts while the maximum or 'tight' condition requires at least 500 microvolts

Three buttons below the display allow the LEDs to be turned off for power saving function, HIGH or LOW transmit power selection and an audio tone control that permits some degree of high frequency cut.

Below the row of buttons is a moulded plastic grill to protect the 35mm diameter loudspeaker and right at the bottom edge of the front panel are three tiny holes that carry the voice frequencies to the sensitive electret microphone.

On the right hand side a concentric type power socket is labelled CHARGER.

This aperture permits battery charging for Ni-Cad cells if installed.

The battery can be charged from one of the approved wall-socket style chargers or from the cigarette lighter socket in most vehicles.

### DO NOT TRY THIS!

DO NOT attempt to charge ordinary dry cells as this could result in great personal danger to the operator.

We found that if a 12 volt dc source was connected to the radio - with the battery removed - the rig functioned quite well from just the external supply.

The handbook does not mention this power-up configuration so proceed with caution if you decide to use this method.

### SOUNDS GREAT

The transmitted signal from the TX-800 sounds great, thanks mostly to the electret microphone clarity, however, the handbook quotes 3.5 watts output power and the best we could raise was 3 watts even.

According to the book the TX-800 is pretty power hungry and it draws 1.6 amps of current when transmitting on maximum power.

We could only manage 1 amp drain in our tests. The BNC antenna connector makes life easy if you want to use an external antenna and we found the overall performance great with our trusty base station antenna connected.

Reception is also good with 0.5 microvolts sensitivity and recovered audio is enhanced with the use of an external speaker.

The current drain on receive is quite small with or without the channel display illuminated. Overall, a great portable 11m rig.

As I said at the start of this review, the TX-800 has been a long time coming but now that it's finally arrived it's probably been worth the wait.


## R.A.D.A.R. SCANWEST

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9. TV JOE'S: Unit 9, Rockingham Business Centre (09) 527 1806
10. ALTRONICS RETAIL: 174 Roe St, Northbridge (09) 328 1599

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EDITOR PETER PHILLIPS
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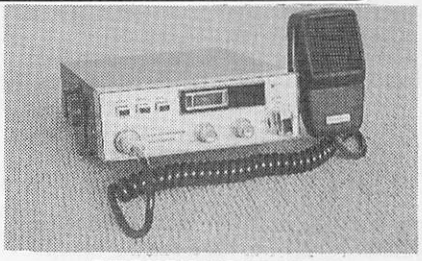
## UHF CB

**BUSHRANGER MKII**

Same features as Bushranger MKI and includes also dual watch scan (operator selectable) 10 position Selcall switch for multiple TX codes when Selcall module fitted. Optional switch for front panel selection of dual watch channels.

**EXECUTIVE**

Same features as Bushranger MKI and includes the following extra features:—
★ 40 channel scan with 9 selectable priority channels
★ 9 memory channels with memory scan
★ 100 consecutive mobile Selcall. TX codes available from front keyboard.
★ Optional alarm inputs/outputs
★ Self-diagnostic test facility
★ Backlit liquid crystal display and signal/power meter



**BUSHRANGER MKI**

This UHF CB radio combines a proven design with high reliability and has the following features:—
★ 40 channels with 8 repeaters
★ Heavy duty mounting brackets
★ Signal/power meter
★ Automatic 24 volt-12 volt operation
★ 12 months warranty
★ Pre-wired for Selcall PCB

PRODUCT COLOUR CATALOGUE AVAILABLE ON REQUEST
UNIT 13/121 NEWMARKET RD, WINDSOR, BRISBANE 4033

*Looking for Western Australian Frequencies...?*
*...well here you go.*

# W.A. '000' CALLING!

*By "Radar"*

**As an avid reader and now West Australia correspondent for CB ACTION MAGAZINE, I think it only appropriate for me to firstly introduce myself.**

Two years ago I bought my first frequency register, a locally produced version which covered the frequency range of 200KHz-956MHz.

Alas it didn't provide me with the relevant info, especially where duplexed frequencies existed. I did some investigating of may own and purchased a full set of the now not available DoTaC microfiche and a second-hand fiche viewer.

I then went to work with my trusty old IBM and compiled and printed edition one of RADAR/SCANWEST, which was bound in a Belmont (W.A.) printing shop.

Only 12 were printed due to malfunction of the old IBM word processor, however, 10 copies were bought up by WACB centre on trial and although slow to move at first, they eventually went.

WACB proprietor Wolfgang asked if I would please supply more SCANWEST, so I decided to get the updated frequencies from DoTaC and go one better.

I employed a desk top publisher and printer to do the compiling and binding work while I did the heavy ground work.

The rest is history and now, with the release of edition 3 of SCANWEST (mid NOVEMBER), I have been requested to print a trial edition for NSW/VIC/QLD & SA.

These will be printed in conjunction with SCANWEST 3 and will be distributed by: ALTRONICS DISTRIBUTION and advertised in their annual catalogue due out about FEBRUARY 1993, so look out for that.

Those registers will come under the name of RADAR/state 1993.

Now that you have an idea of what I'm about and what I do, here then is my first offering of WA '000' services and their codes.

If this is greeted with some enthusiasm, then I'll do further write ups as and when I have things of relevant interest to write about, so happy scanning and cheers for now from.....RADAR.

***All correspondence to:***
***RADAR REGISTERS***
***P O BOX 297***
***CLOVERDALE WA 6105.***

## *WA POLICE FREQUENCIES*

### *HF (MHz)*

| | |
|---|---|
| 3.8255 | LONG RANGE COMMUNICATIONS |
| 4.5585 | SPARE |
| 4.5615 | SPARE |
| 5.1815 | LONG RANGE COMMUNICATIONS |
| 7.6585 | SPARE |
| 7.6615 | LONG RANGE COMMUNICATIONS |
| 9.0545 | LONG RANGE COMMUNICATIONS |
| 10.5065 | SPARE |
| 16.2245 | LONG RANGE COMMUNICATIONS |

### *VHF*

| | | |
|---|---|---|
| 78.730 | 9B | Statewide |
| 78.760 | 10B | Metro |
| 79.090 | 10A | Statewide (Escorts) |
| 79.105 | 1B | Central AG: Districts |
| 79.120 | 2A | Statewide |
| 79.135 | 2B | Statewide Highways |
| 79.150 | 3A | Broome-Carnarvon |
| 79.165 | 3B | Eastern Districts |
| 79.195 | 4B | Southwest Corner |
| 79.210 | 5A | Kalgoorlie - Esperance |
| 79.225 | 5B | Merredin - Kalgoorlie |
| 79.240 | 6A | Newman - Karratha |
| 79.255 | 6B | Southern AG: Districts |
| 79.270 | 7A | Port Hedland |
| 79.285 | 7B | Mandurah |
| 79.300 | 8A | Kalgoorlie Area |
| 79.330 | 9A | Wyndham - Karratha |

### *LINK FREQUENCIES*

### *VHF-MID*

169.450/173.160 -- 169.630/173.100

### *UHF-Lo to MID*

| | |
|---|---|
| 413.475/404.025-- | 413.500/404.050-- 413.700/404.250 |
| 413.725/404.275-- | 413.750/404.300-- |
| 413.775/404.325-- | 413.800/404.350-- 413.900/404.550 |
| 414.025/404.575-- | 414.050/404.600-- 414.100/404.650 |
| 414.175/404.725-- | 414.250/404.800-- 414.325/404.875 |
| 414.425/404.975-- | 460.100/450.600-- 460.200/450.700 |
| 460.300/450.800-- | 460.400/450.900 |
| 476.250/471.050 | Statewide Mobiles |

## *64 CHANNEL UHF ALLOCATIONS*

| CH | FREQ(TX/RX) | ALLOCATION |
|---|---|---|
| 01 | 467.850/458.350 | Dwellingup, Telfer/portables |
| 02 | 467.875/458.375 | Southside, Cue, Eucla, Exmouth |
| 03 | 467.900/458.400 | Reserved for Functions/portables |
| 04 | 467.925/458.425 | Highway Patrols to Lancelin & Dandaragan |
| 05 | 467.950/458.450 | Gin Gin, Dandaragan |
| 06 | 467.975/458.475 | Joondannar (enquiries) |
| 07 | 468.000/458.500 | Rottnest Island |
| 08 | 468.025/458.525 | Southside Tasking |
| 09 | 468.050/458.550 | Reserved for Traffic Patrols |
| 10 | 468.075/458.575 | Bindoon, Warrona |
| 11 | 468.100/458.600 | Highway Patrols to Brookton & Ravensthorpe |
| 12 | 468.125/458.625 | Fremantle (Spearwood Area) |
| 13 | 468.150/458.650 | Fremantle (Western Area) |
| 14 | 468.175/458.675 | Spare (Metro) Northam, Wyndham & York |
| 15 | 468.200/458.700 | Dowergin,Kununurra & Perth Traffic |
| 16 | 468.225/458.725 | Fremantle (Rockingham area) |
| 17 | 468.250/450.750 | Mukinbudin, Mandurah Tasking |
| 18 | 468.275/458.775 | Warwick (Ocean Reef Area) |
| 19 | 468.300/458.800 | Waterman (Enquiries) |
| 20 | 468.325/458.825 | Kensington (Enquiries & F.S. Tasking) |
| 21 | 468.350/458.850 | Kings Pk -Bayswater (Northside) |
| 22 | 468.375/458.875 | Denham, Nannup, Seabird |
| 23 | 468.400/458.900 | Kalgoorlie Tasking, Fremantle, Boyup, Margaret River |
| 24 | 468.425/458.925 | Perth Beats,Pemberton |
| 25 | 468.450/458.950 | VKI training, Bunbury Tasking, Toodyay |
| 26 | 468.475/458.975 | Operations & Statewide Mobiles |
| 27 | 468.500/459.000 | Perth portables (DVP) |
| 28 | 468.525/459.025 | Warwick (Wanneroo area) |
| 29 | 468.550/459.050 | Busselton, Dunsborough |
| 34 | 468.675/459.175 | Reserved for special events |
| 35 | 468.700/459.200 | Fremantle portables |
| 36 | 468.725/459.225 | Traffic Portables |
| 37 | 468.750/459.250 | Northside (Kalamunda area) |
| 38 | 468.775/459.275 | Statewide Portables |
| 39 | 468.800/459.300 | Perth Area (DVP) |
| 40 | 468.825/459.325 | Northside (Gidgegannup) |

| | | |
|---|---|---|
| 41 | 468.850/459.350 | Warwick Tasking |
| 42 | 468.875/459.375 | Midland Portables |
| 43 | 468.900/459.400 | Fremantle Portables |
| 44 | 468.925/459.425 | Statewide Portables |
| 45 | 468.950/459.450 | VKI-Emergency Services Link |
| 46 | 468.975/459.475 | Kalamunda Portables |
| 47 | 469.000/459.500 | Fremantle Tasking |
| 48 | 469.025/459.525 | Warwick (Balga Area) |
| 49 | 469.050/459.550 | Northside (Mundaring (area) |
| 50 | 469.075/459.575 | VKI Spare |
| 51 | 469.100/459.600 | Car & Operating Statewide |
| 54 | 469.175/459.675 | Northside Tasking (Inglewood-Kalamunda) |
| 56 | 469.225/459.725 | Traffic Mobiles |
| 59 | 469.300/458.800 | Fremantle Operations |
| 63 | 469.400/459.900 | T.R.G. Operations (DVP) |
| 64 | 469.425/459.925 | Rockingham Portables |

## VKI TASKING CODES

***Responses to various tasks will have priority and category codes which will determine the level of response to an event as follows:***

**CATEGORY A** = This is used for pressing emergencies and is limited to those events where life is or may be threatened, lights & sirens are used.

**CATEGORY B** = Authorises the use of lights and sirens whilst in pursuit of a vehicle on attending at a scene as expeditiously as is reasonable within the bounds of it being safe to do so.

**CATEGORY C** = Covers duress alarms, bomb threats and other emergencies/disasters not already mentioned, lights and sirens are used.

**NIL CATEGORY** = Covers all routine tasks and does not authorise the use of lights and sirens.

| CODE/CAT | PRIORITY | TASK |
|---|---|---|
| 101 / A | 1 | Armed Holdup in Progress |
| 106 / A | 1 | Armed Offender - Incident in Progress |
| 151 / A | 1 | other life threatening incident |
| 201 / C | 2 | Armed Holdup |
| 204 / C | 2 | Homicide |
| 206 / C | 2 | Armed Offender |
| 208 / C | 2 | Offender Being Held-Violent |
| 209 / C | 2 | Sexual Assault-Rape |
| 210 / C | 2 | Shots Fired-Serious |
| 211 / C | 2 | Serious Assault |
| 212 / C | 2 | Stealing with Violence |
| 228 / C | 2 | Disturbance-Serious |
| 229 / C | 2 | Domestic-Serious |
| 233 / C | 2 | Duress Alarm-Urgent |
| 234 / C | 2 | Person Collapsed-Serious |
| 235 / C | 2 | Police in Trouble-Serious |
| 237 / C | 2 | Shoplifter-Violent |
| 239 / C | 2 | Suspicious Person-Urgent |
| 244 / C | 2 | Ambulance Escort-Urgent |
| 251 / B | 2 | Pursuit &/or any other emergency not covered |
| 303 | 3 | Bomb Threat (may be upgraded) |
| 307 | 3 | Offender on Premises (upgradable) |
| 308 | 3 | Offender being held (upgradable) |
| 309 | 3 | Sexual Assault (upgradable) |
| 310 | 3 | Shots Fired (upgradable) |
| 311 | 3 | Assault-Serious |
| 314 | 3 | Wilful Exposure |
| 315 | 3 | Accident-injury (upgradable) |
| 316 | 3 | Accident-Fatal (upgradable) |
| 317 | 3 | Drink Driving |
| 318 | 3 | Hit & Run |
| 320 | 3 | Traffic Hazard-type |
| 325 | 3 | Assault |
| 328 | 3 | Disturbance |
| 329 | 3 | Domestic |
| 330 | 3 | Alarms (Silent &/or Audible) |
| 331 | 3 | Fire-Building |
| 332 | 3 | Fire-Other |
| 333 | 3 | Duress Alarm |
| 334 | 3 | Person Collapsed |
| 335 | 3 | Police Require Backup |
| 338 | 3 | Sudden Death |
| 339 | 3 | Suspicious Person |
| 343 | 3 | Flare Sighting |
| 349 | 3 | Missing Person |
| 302 | 4 | Break & Enter |
| 305 | 4 | Interfere with Motor Vehicle |
| 312 | 4 | Stealing |
| 313 | 4 | Unlawful Use of Motor Vehicle |
| 324 | 4 | Abandoned Stolen Vehicle |
| 336 | 4 | Premises Open |
| 337 | 4 | Shoplifter |
| 350 | 4 | Person Found |
| 351 | 4 | Other Tasks Not Listed |
| 352 | 4 | Restraint order breach |
| 321 | 5 | Traffic Holdup |
| 323 | 5 | Abandoned Vehicle |
| 340 | 5 | Damage |
| 344 | 5 | Escort-Ambulance, prisoner, mental health |
| 347 | 5 | Animal injured |
| 319 | 6 | Traffic-Type |
| 322 | 6 | Traffic control lights U/S |
| 342 | 6 | Noisy Party/other |
| 326 | 7 | Return to Office |
| 327 | 7 | Contact your office |
| 341 | 7 | Notification |
| 345 | 7 | Print/Photo Job |
| 346 | 7 | Drunk & Disorderly |
| 353 | 7 | Found/Stolen Property |
| 501 | 7 | Unclassified (Non-Urgent) Task |

### Vehicular Codes

| | | |
|---|---|---|
| ALPHA | = | Inspector/Supervisor |
| A.P. | = | Army/Military Police |
| BRAVO | = | Media/PR |
| CHARLIE | = | CIB. |
| DELTA | = | 79 Division (Drugs & Pursuits) |
| ECHO | = | Technicians |
| F.S. | = | Forensic Scientists |
| GOLF | = | General Duties & Metro Patrol (Flying Squad) |
| INDIA | = | Photography Unit |
| KILO | = | Heavy Haulage Squad |
| LIMA | = | Liquor & Gaming Squad |
| MIKE | = | Motor Bike (traffic) |
| OSCAR | = | Tactical Response Group (TRG.) |
| POLAIR | = | Police Air Wing vis: Polair 1 |
| QUEBEC | = | Gaol Breakout Squad |
| SIERRA | = | Urban Security Vehicles |
| TANGO | = | Traffic & Pursuit Vehicles |
| VICTA-MIKE | = | Water Police |
| XRAY | = | Break & Enter Squad |
| XRAY-OSCAR | = | Truancy Patrols |
| YANKEE | = | Police Aboriginal Aids |
| ZULU | = | Protective Services (Federal Police) |

### Metro Stations & Cars

| STATION | CAR No | SEQ: |
|---|---|---|
| Armadale | | 300-304 |
| Maylands | | 425-428 |
| Ballajura | | 307-000 |
| Midland | | 435-444 |
| Bayswater | | 308-309 |
| Morley | | 445-449 |
| Belmont | | 310-314 |
| MT. Hawthorn | | 455-459 |
| Bentley | | 315-319 |
| Mundaring | | 460-464 |
| Brentwood | | 325-329 |
| Mundijong | | 465-469 |
| Bullsbrook | | 330-334 |
| Nedlands | | 470-474 |
| Cannington | | 335-339 |
| Nollamara | | 475-479 |
| Claremont | | 345-349 |
| Nth Perth | | 485-489 |
| Cockburn | | 350-354 |
| Palmyra | | 490-493 |
| Cottesloe | | 355-359 |
| Quinns Rock | | 494-000 |
| Fremantle | | 360-374 |
| Rockingam | | 495-499 |
| Gosnells | | 375-379 |
| Scarborogh | | 500-505 |
| Hilton Park | | 380-384 |
| Sth Perth | | 509-000 |
| Innaloo | | 385-389 |
| Subiaco | | 510-514 |
| Inglewood | | 390-394 |
| Two Rocks | | 515-519 |
| Joondalup | | 395-399 |
| Victoria Park | | 520-524 |
| Kalamunda | | 405-408 |
| Wanneroo | | 530-534 |
| Koondoola | | 410-414 |
| Warwick | | 535-539 |
| Kwinana (Medina) | | 430-434 |
| Wembley | | 550-554 |
| Leederville | | 418-419 |
| Lockridge | | 420-424 |

## WA FIRE BRIGADE

### Turnout Codes

| | | |
|---|---|---|
| 4-4 | = | Arrived, no smoke sighted |
| 6-6 | = | Arrived, smoke sighted, 1st alarm, investigating |
| 8-8 | = | Arrived, 2nd alarm, backup required |

### Appliances in use

| | | |
|---|---|---|
| BACU | = | Breathing Apparatus Control Unit |
| ET | = | Emergency Tender |
| FMC | = | Foam Monitor Carrier |
| HP | = | Hydrolic Platform (also known as Heavy Pump) |
| TTL | = | Turntable Ladder |
| PC | = | Personell Carrier |
| LT | = | Light Tanker |
| MT | = | Medium Tanker |
| HT | = | Heavy Tanker |
| MCU | = | Mobile Command Unit |
| TL | = | Tower Ladder pump & ute. |

### Metro Stations

ARMADALE, BASSENDEAN, BEDFORD, BELMONT, CLAREMONT, DAGLISH, FREEMANTLE, GOSNELLS, MIDLAND, OCONNOR, OSBORNE PARK, PERTH, SPEARWOOD, WANGARA, WELSHPOOL

*(Continued on page 55...)*

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AUSTRALIA'S BEST
BASE STATION ANTENNA!

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★ NO COILS
★ NO RINGS
★ NO TUNING

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**STARDUSTER-5** (5-element beam) . . **$190**
**STARDUSTER-6** (6-element beam) . . **$220**

**LASER-6 DUAL-POLARITY BEAM**
(3 x Horizontal and 3 x Vertical) . . **$250**

**LASER-8 DUAL POLARITY BEAM**
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**THE CB MODIFICATION HANDBOOK** covers Australia's most common CB radios. Everything from a few extra channels to full-house conversions covering hundreds of channels. 5 kHz steps, increasing power, slides etc. Price $15. $1.50 P&P.

**THE CB PLL DATA BOOK** is the CB modifier's Bible. This all-new international edition covers fifty specific phase-locked loop ICs, with manufacturers' cross-references. Price $15, $1.50 P&P.

**THE SCREWDRIVER EXPERT'S GUIDE** will enable the average non-technical CBer to locate and repair up to 95% of CB radio problems, as well as helping the advanced hobbyist to tune and modify hisequipment for improved performances. Price $15. $1.50 P&P.

**CB ANTENNA CONSTRUCTION,** illustated plans for quarter-wave and half-wave ground-planes, two-element quad, three-element beam, and high-performance stacked beams. Price $3 including postage.

**HAM AND CB ANTENNA DIMENSIONS** 130 charts covering dipoles, beams, quads, vees, triangles, and verticals. An essential reference work for any serious antenna builder, this book covers the CB band, HF bands from160 metres to 10 metres and the 2 and 6 metre bands. Price $15, $1.50 P&P.

BANKCARD . . . VISA . . . MASTERCARD . . . welcome by mail or phone. ($25 MINIMUM)

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***(P/T Metro Stations)***
KALAMUNDA & ROCKINGHAM

***COUNTRY STATIONS***
ALBANY, BUNBURY, GERALDTON, KALGOORLIE, NORTHAM.

***FREQUENCIES***
76.460 (simplex)

| | |
|---|---|
| 76.610/75.830 | Perth-Fremantle |
| 77.090/76.070 | Perth-Red Hill |
| 77.120/76.130 | Perth-Canning Mills |
| 81.400/78.900 | Canning Mills |
| 81.425/78.925 | Albany/Rockingham |
| 81.475/78.975 | Gin Gin |
| 81.500/79.000 | Claremont |
| 81.525.79.025 | Pinjarra |
| 81.550/79.050 | Red Hill |
| 81.600/79.100 | Bunbury/Northam |
| 81.625/79.840 | Canning Mills |
| 119.100(AM) | Simplex Statewide |

***ST. JOHNS AMBULANCE (WA)***

***NEW "UHF" LISTINGS***

| | |
|---|---|
| 412.475/403.025 | Belmont-Lesmurdie |
| 412.575/403.125 | Belmont-Padbury |
| 412.650/403.200 | Belmont-Lesmurdie |
| 412.750/403.300 | Byford, Fremantle, Lesmurdie, Padbury, Perth, Quinns Rock, Red Hill, Rockingham, Rottnest, Gigegannup, W. Perth. |
| 413.025/403.575 | Belmont-Quinns Rock |
| 413.075/403.625 | Belmont-Byford |
| 413.100/403.650 | Belmont-Red Hill |
| 413.125/403.675 | Belmont-Perth-Rockingham |
| 413.150/403.700 | Belmont-W.Perth |
| 413.175/403.725 | Byford, Fremantle, Lesmurdie, Red Hill |
| 413.300/403.850 | Belmont-Byford |
| 413.350/403.900 | Belmont-Fremantle |
| 413.375/403.925 | Belmont-Red Hill |
| 413.425/403.975 | Belmont-Rottnest-Gidgegannup |
| 413.475/404.025 | Cunderdin, Narrogin, Wickepin |
| 413.525/404.075 | Belmont-Gin Gin-Badgingarra, Carnarvon, Collie, Corrigin, Darkan, Geraldton, Ghooli, Hyden, Kondinin, Lancelin, Moorine Rock, Meekatharra, Mt. Magnet, Southern Cross |
| 414.150/404.700 | Belmont, Byford, Busselton, Cue, Goomalling, Kojonup, Manjimup |
| 414.375/404.925 | Northam, Toodyay, Pinjarra |
| 414.450/405.000 | Bridgetown, Bunjil, Coorow, Goongarrie, Kalbarri, Merredin, Morawa, Three Springs |
| 414.475/405.025 | Badgingarra, Belmont, Dandaragan, Gairdner, Gnowangerup, Jerramungup, Kellerberrin, Laverton, Leonora, Moora, Northampton, Red Hill, Wiluna |
| 458.025 Simplex | WA Wide |
| 458.075 Simple | WA Wide |
| 460.000/450.500 | Boddington |
| 460.575/451.075 | Beverley, Wongan Hills, York |
| 463.275/453.775 | Byford, Fremantle, Lesmurdie, Badbury, Perth, Quinns Rock, Red Hill, Rockingham, Rottnest, Gidgegannup, WA WIDE. |
| 469.525 Simplex | Perth |
| 469.575 Simplex | Perth |
| 469.675 Simplex | Bunbury-Manjimup-Donnybrook-Nannup |
| 494.800 Simplex | Perth |

***ST JOHNS AMBULANCE (WA)***

***PRIORITY CODES***

| | | |
|---|---|---|
| 1 | = | LIGHTS & SIRENS (URGENT) |
| 2 | = | ASAP (No Lights & Sirens) |
| 3 | = | Routine (non urgent) |

***TRAUMA CODES***

| | | |
|---|---|---|
| 1 | = | Domestic Accident |
| 2 | = | Vehicle Accident |
| 3 | = | Sports Accident |
| 4 | = | Industrial Accident |
| 5 | = | Assault |
| 6 | = | Burns |
| 7 | = | Collapse |
| 8 | = | Hanging |
| 9 | = | Murder/Suicide |
| 10 | = | Rape |
| 11 | = | Shooting |
| 12 | = | Stabbing |
| 13 | = | Other |

***SURGICAL***

| | | |
|---|---|---|
| 14 | = | Acute Abdominal |
| 15 | = | G.I.T. Blood |
| 16 | = | Gynecological |
| 17 | = | Obstetric |
| 18 | = | Baby Born |
| 19 | = | Other |

***CARDIAC***

| | | |
|---|---|---|
| 21 | = | Cardiac Arrest |
| 22 | = | Chest Pain |
| 23 | = | Electrocution |
| 24 | = | Near Drowning |
| 25 | = | Pulmonary Edema |
| 26 | = | Other |

***MEDICAL CODES***

| | | |
|---|---|---|
| 31 | = | Allergy |
| 32 | = | Asthma |
| 33 | = | Bites & Stings |
| 34 | = | CVA |
| 35 | = | Debility |
| 36 | = | Dehydration |
| 37 | = | Altered Consciousness |
| 38 | = | Diabetics |
| 39 | = | Disturbed/Abnormal Behaviour |
| 40 | = | Drug/Alcohol O.D. |
| 41 | = | Fits/Convulsions |
| 42 | = | Hypothermia |
| 43 | = | Infections |
| 44 | = | Neonatal |
| 45 | = | Poisoning |
| 46 | = | Respiratory Distress |
| 47 | = | Cancer |
| 48 | = | Cancer Terminal |
| 49 | = | Other |

***ROUTINE***

| | | |
|---|---|---|
| 51 | = | Cat Scan |
| 52 | = | Cardiac Catheter |
| 53 | = | Day Treatment |
| 54 | = | Dialisys |
| 55 | = | Hospital Discharge |
| 56 | = | Radiotherapy |
| 57 | = | Sporting Fixture |
| 58 | = | RFDS to..... |
| 59 | = | Oher |

***MISCELLANEOUS***

| | | |
|---|---|---|
| 61 | = | Hoax Call |
| 62 | = | Ambulance Not Required |
| 63 | = | Relief Duty at....Depot |

***SUNDRY CODES***

| | | |
|---|---|---|
| 71 | = | Bomb Alert |
| 72 | = | Disaster Exercise |
| 73 | = | Message |
| 74 | = | Patient Deceased |
| 75 | = | P.R. Visit |
| 76 | = | Standing By |
| 77 | = | Other |

***TIME CODES***

| | | |
|---|---|---|
| 79 | = | Arrival At Scene |
| 80 | = | Depart Scene For... |
| 81 | = | Destination |
| 82 | = | Cleared |
| 83 | = | At Depot |
| 84 | = | Police |
| 85 | = | Fuel, Petrol etc., |
| 86 | = | |
| 87 | = | |
| 88 | = | Belmont H.Q. |
| 89 | = | Return to Depot |
| 90 | = | Other |

***PATIENT CODES***

| | | |
|---|---|---|
| A | = | Fair |
| B | = | Serious |
| C | = | Critical |
| D | = | Satisfactory |


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# AUSTRALIAN ASSOCIATION OF CITIZENS and BAND RADIO OPERATORS INC.

INC

## CBRS INCLUDED IN MAJOR OVERHAUL OF RADIO FREQUENCY POLICY

ACBRO Inc. observed in Adelaide problems when some of their members had difficulty in finding the office of DOTC which had recently moved to another building in the city.

In a letter sent to the Minister for Communications, ACBRO provided information relating to this problem and offered the suggestion that such could be overcome if the Department made arrangements for CBers around Australia to effect license renewals at their local post office.

This it was thought would at least save the CBer the price of the postage stamp which adds to the costs of the CB hobby, where most claim that the licence fee is a charge made for which there is no service in return.

In less than a month, a record for "prompt reply" was created, and the following letter was received, which adds legitimacy to the often quoted fact that "Governments appear to not operate on the basis of logic".

**Our Reference: R92/151**
**3rd November, 1992.**

**Mr T Colwell**
**ACBRO Inc.**
**Dear Mr Colwell**

Thank you for your letter dated 6th October 1992, on behalf of the Australian Association of Citizens and Band Radio Operators Inc., to the Minister for Transport and Communications, concerning payment of licence renewals.

The Minister has asked me to reply on his behalf.

I regret the inconvenience that the relocation of our offices causes at times. The Department advises licensees of address changes by placing an announcement in the main newspapers of the relevant states.

The Department endeavors to keep the information on its stationary current but there are occasions when First and Final notices are dispatched to licensees prior to the printing contractor receiving notifications of address changes.

In 1989/90 the Department of Transport and communications conducted a trial in Western Australia whereby Citizen Band license fees could be paid at Post Offices. The trial revealed that the procedure was not as efficient as anticipated and was not cost effective.

The Department is currently considering further options for making renewals both cost effective and convenient for licensees.

**Your sincerely.**
**Gwen Andrews**
**Assistant Secretary**
**Radio Communications Division**

## A TAD CONFUSED MAYBE...

This letter was received with perplexed concern.

The bottom line indicated that for all of the great organisations who were able to serve the community by bringing a bill paying agency to their front door, DOTC was not one of them.

ACBRO, which is known to make suggestions to the Minister's office from time to time, had thought that surely this one would have sufficient merit to warrant consideration and were particularly surprised (as they knew this system had been operating in Western Australia) that it was not acceptable as a good idea.

In referring this matter to the President of ACBRO, for his thoughts, his first reaction was, "No! this is not right".

He then referred to a file of documents that he was studying, and produced a media release from Bob Collins, Minister for Transport & Communications, dated 15th. September 1992, which stated that Senator Collins had decided to accept a three-part strategy which includes allowing users to renew licences at banks, post offices, etc.

This and other interesting points are shown in the following extract from this media release (20/92 - 15/9/92) which may indicate that in the offices of this department, **"the right hand knoweth not what the left had is doing".**

Senator Collins said, "the Government had decided to adopt a three-part reform strategy".

It intends to:

***# carry out the phased introduction, in selected areas of the spectrum, of a market-based system of spectrum management using tradeable spectrum access rights;***
***# improve legislation and administration by - introducing a more flexible standards regime;***
***- introducing class licensing for small, low-power users of the spectrum;***
***- eliminating the practice of allowing users to reserve unused spectrum at reduced fee levels;***
***- allowing users to renew licences at banks, post offices, etc; and***
***# create a Spectrum Management Agency to implement the reforms.***

More than one million licences are issued annually under the Radio Communications Act 1983.

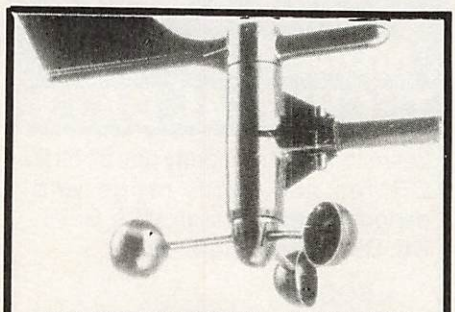
Users of the spectrum include large business and industrial concerns, government organisations, small business, voluntary groups and private individuals.

They engage in activities including telecommunications, aviation, mining, road and sea transport, defence, electricity and gas delivery, search and rescue, and scientific pursuits.

Services are within such diverse areas as data transfer, land mobile, fixed link, paging, satellite, maritime and aeronautical communications, CB radio, defence and many more.

The reforms do not cover the broadcasting spectrum (AM/FM radio, VHF/UHF television).

Spectrum for these users will be allocated by the new Australian Broadcasting Author-

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ity under the Broadcasting Services Act 1992.

There will be special arrangements for public and community services.

Senator Collins said that in coming months his department would consult with users and other interested organisations and individuals over introduction of the reforms.

We understand that a public information paper will be available in the near future.

Now, where does this leave the people?

Has the Minister mislead the Parliament and the CBers by saying that the Government will accept a strategy, which six or seven weeks later the Assistant Secretary (on his behalf) indicates otherwise?

Perhaps a sign may be soon seen at the Post Office stating that "license renewals can be paid here" - and that same sign will be removed and replaced at intermittent intervals as the people in high places change their minds.

## CBRS LICENSE FEES REMAIN THE SAME

A request to halt license fee increase was detailed in last issue of CB ACTION, describing one of the many ways in which ACBRO work for CBers generally.

A reply to a letter sent to the Minister, published then, has come to hand.

It provides an insight to how a response can be given without directly answering the question, which as it happens, could have been done quite simply.

This is what Minister Collins said under his own signature....

**12 October, 1992**
**Mr T G Colwell**
**Australian Association of Citizens and Band Radio Inc.**

Dear Mr Colwell

Thank you for your letter dated 31 August 1992 concerning increases to the CBRS licence fee.

As Mr Snowdon advised you, licence fees for all classes of radio communications transmitters are linked to the Consumer Price Index (CPI).

The Government has just announced its new spectrum management and pricing policy. A copy of my statement to Parliament is enclosed for your information. You will note that we will be undertaking a major overhaul of the existing system of licence fees and pricing. Your comments will be helpful in our consideration of the matter and I should like to thank you for them.

**Yours sincerely,**
**(Bob Collins).**

This response appeared a little vague and promoted, soon after receipt, a 'phone call to the local DOTC office which was able to confirm that there was no license fee increase planned for December 1st as was the "norm". The result of such a decision represented a saving to CBers around Australia, collectively, of over $410,000. It is reasonable to think that ACBRO may take credit for such an achievement although some may say that this relief would have come without their efforts.

## ACBRO ASSOCIATED CLUBS

**Below is a list of clubs and organisations affiliated with ACBRO Inc. If you have one of them in your area, please give them your support of membership.**
**Full details can be obtained by contacting the group of your choice from below.**
**For membership or affiliation enquiries please contact:**
**ACBRO Inc., P.O. Box 170, Walkerville 5081, South Australia**

| | |
|---|---|
| ALPHA WHISKY ALPHA RADIO CLUB | P.O. Box 1457, Albany, W.A. 6330 |
| ALBANY COMMUNICATIONS GROUP | 65 Hassell St. Elleker, W.A. 6330 |
| RADIO CITY AUSTRALIA | 26 Wootten St. Greenacres S.A.5086 |
| PIONEER RADIO ASSOCIATION (S.A.) | P.O. Box 1017 Salisbury, S.A. 5108 |
| PLANTAGANET REP'T INSTITUTE OF W.A. | PMB 306, Cranbrook, W.A. 6321 |
| BURNIE CITIZENS RADIO CLUB. | P.O. Box 655, Burnie, Tasmania 7320 |
| TRANSWORLD C.B. RADIO CLUB | 90 Crozier Avenue, Daw Park, S.A. 5041 |
| CANNING RIVER RADIO CLUB | 53 Parkside Ave Mt Pleasant W.A. 6153 |
| OVERLAND RADIO CLUB | P.O. Box 1010 Murray Bridge, S.A. 5235 |
| EUREKA C.B. RADIO CLUB | P.O. Box 27, Reynella S.A. 5161 |
| HACKMAN RADIO CLUB | P.O. Box 13, Hackham, S.A. 5163 |
| EAGLE RADIO GROUP | P.O. Box 302, Morphett Vale S.A. 5162 |
| ROTTEN RADIO GROUP INTNL | P.O. Box 4, Dry Creek. S.A. 5094 |
| BROKEN HILL UHF REPEATER CLUB Inc. | P.O. Box 1023, Broken Hill, N.S.W. 2880 |
| RIVERLAND C.B. CLUB | P.O. Box 742, Loxton S.A. 5333 |
| GIPPSLAND REPEATER ASSOC. Inc. | P.O. Box 555, Maffra, Vict. 3860 |
| MURRAY BRIDGE AGRIC. & HORT.SOCIETY | P.O. Box 315 Murray Br. S.A. 5235 |
| SAMBA CLUB | P.O. Box 16, Salisbury, S.A. 5108 |
| TWEED RADIO DX GROUP INTNL. | P.O. Box 773, Murwillumbah, NSW.2484 |
| THE PATHFINDER RADIO SOC. CLUB. | P.O. Box 24, Woodridge, QLD 4114 |
| DIRTY DOZEN RADIO GROUP | P.O. Box 380, Blair Athol, S.A. 5084 |
| HOTEL ZULU RADIO GROUP Inc. | P.O. Box 66, Elizabeth, S.A. 5112 |
| WHITE FOX RADIO CLUB | P.O. Box 288, Salisbury, S.A. 5108 |
| MEGA MOUTH INTERNATIONAL | P.O. Box 1534, Launceston, Tas 7250 |
| THE TRIPLE "R's" GROUP | 451 Regency Road, Sefton Park,S.A.5083 |
| TRU BLUE RADIO GROUP | P.O. Box 379, Blackwater, QLD 4717 |
| BLUE O RADIO GROUP | P.O. Box 53, Monaro Cresc. A.C.T 2603 |
| SYDNEY RADIO GROUP | P.O. Box 185, Gordon, N.S.W. 2072 |
| UHF ASSOC. OF W.A. INC. | P.O. Box 1238 East Victoria Pk WA 6101 |
| RATBAG CB. RADIO CLUB | P.O. Box 227, Welland, S.A. 5007 |
| SUN CENTRE C.B. RADIO CLUB | P.O. Box 912, Swan Hill, Vict. 3585 |
| PEGASUS CB RADIO CLUB | Cab 1 100 Jabez St Broken Hill NSW 2880 |
| SOUTH AUSTRALIA RADIO | P.O. Box 162, Campbelltown S.A. 5074 |
| PORT ADELAIDE RADIO CLUB | P.O. Box 218, Alberton, S.A. 5014 |
| CHEROKEE INDIAN AUST. GROUP | P.O. Box 1679, Mildura, Vict. 3502 |
| STH. WEST DISTRICT CB RADIO CLUB | P.O. Box 620, Warrnambool, Vict. 3280 |
| A.M.O.S. CB RADIO CLUB INTNL. | P.O. Box 351, Broken Hill, N.S.W. 2880 |
| PIONEER RADIO ASSOCIATION AUST. | P.O. Box 112, Bentley, W.A. 6102 |
| NARACOORTE UHF ASSOCIATION | P.O. Box 465, Naracoorte, S.A. 5271 |
| GOSFORD CITIZENS RADIO CLUB | P.O. Box 447, Gosford, N.S.W. 2250 |
| FELIX RADIO CLUB | P.O. Box 78, Goodna, QLD 4300 |
| INLANDER CB RADIO CLUB | P.O. Box 5712, Rockhampton, QLD 4702 |
| AUST. RED-HEELER SOC. RADIO CLUB | P.O. Box 313, Drysdale, Vict. 3222 |
| CENTRAL WEST C.B. RADIO CLUB INC. | P.O. Box 628, Orange, N.S.W. 2800 |
| VIC RED HEELER RADIO & DX GROUP | P.O. Box 1802, Ballarat, Vic 3354 |
| KILO ROMEO CIRCLE OF FRIENDS | P.O. Box 16, Cleveland, QLD 4163 |
| RADIO HOBART GROUP | P.O. Box 266, Glenorchy, Tas 7010 |

To those who fit into this category, please realise that the Government last year indicated that license fees would increase by 58 cents - and then slugged CBers one dollar extra per set.

Do you honestly think that the same Government would have ceased the traditional increase if it were not for ACBRO exposing the way in which the CBers were being fleeced?

Any elation over the saving of your part of the $410,000 may become over shadowed by the mystery contained in the minister's letter which says, "...we will be undertaking a major overhaul of the existing system of licence fees and pricing".

It would be greatly appreciated if any reader in possession of a crystal ball would please share their viewing with ACBRO and other CBers.

# GET IT UP AND GET IT RIGHT! - UHF CB AERIALS

**There's probably never been a better time than right now to get into UHF CB radio.**

Besides the array of new gear on the market, many commercial operators are moving over to Telecom's MobileNet cellular phone system, and their dozen-strong UHF networks are being broken up and sold piecemeal on the second-hand market, through the Trading Post newspapers or a local CB store.

If you've been looking for your first 477 MHz set, or are after a mobile to go with your base station, there's plenty to choose from.

Understandably, after you've been bedazzled by the brands names, features and prices all you want to do is just get on air, using any old UHF whip which may be thrown into the deal.

This more than anything else is where the newcomer to UHF CB finds themselves in deep water. 27 MHz CB is quite forgiving, really. Those signals will just rush out of your aerial looking for like-minded company, and while I'm not advocating that you do HF on the cheap it is true that with inexpensive co-ax cable and a basic whip and mount you can get by quite adequately.

Not so on UHF. The intricacies of radio waves and RF mean that at 477 MHz there is no room to cut corners. You either do it right, or not at all. Doing it right means having a crisp noise-free signal into all the local repeaters and having solid, reliable simplex range. This article is about doing it right, and it all begins with the right antenna system.

## Mobile Antennae

The length of UHF CB antenna is extremely critical. At 27 MHz you're dealing with a wavelength of some 11 metres, of which a centimetre or two is a very small proportion when you're tuning and trimming the aerial for the minimum SWR (standing wave ratio) and maximum performance, maximum power transfer from your rig's back end up to the stick and out into the ether.

It's another matter at 477 MHz, which carries a wavelength of some 62 cm. For this reason, the majority of UHF whops are already factory-tuned, and if you do need to make any alterations then proceed very carefully.

Quarter-wave groundplanes are the most basic of UHF whips. They are constructed of stainless steel or wire (for more flexibility) and at 15cm in length are very small indeed. Quarter-wave antennae have an naturally high angle of signal radiation and are best used in hilly country and with repeaters, as they are ideal for carrying the mobile signal from a low point such as your vehicle up to a repeater on the top of a mountain or a city building.

**David Flynn has some quick pointers on antennae for the first-time UHFer.**

The best mounting position for a quarter-wave is in the middle of any groundplane surface which can offer at least the radius of the whip and is unobstructed, such as the middle of a car's metal roof. Selling for around $15 the quarter-wave is inexpensive and works well.

Centre-loaded helical whips are the next step up, with gain figures varying from 3 dB to 4.5 dB. For around $25 these will give you the best of both worlds - a relatively good "flat" signal component for direct car-to-car or simplex range, as well as a good angle for getting into repeaters.

Dipoles are the next step, from a fairly middle-of-the-road 3 dB to centre-loaded whips with a high gain figure of some 6 dB. They retail around the $70-$80 mark. The higher gain causes a flatter radiation angle resulting in more ground-plane aspect for your signal. This longer direct travel is achieved over flat terrain, and the range can be quite stunning in the country - however, a mobile in hilly areas would find themselves at a distinct disadvantage with a high-gain whip, especially where repeaters access is needed.

## Base Stations

The choice of a UHF base antenna is much simpler than that of a mobile.

Almost all UHF base antennae other than directional beams or "Yagi" arrays are of a "co-linear" design. These vertical omen-directional antenna are usually manufactured from fibreglass and aluminium, and the main variant outside the construction and materials used is their gain figure.

The most common figures are 6 dB, 9 dB and 12 dB. Which one is right for you? It depends almost entirely on the surrounding terrain. The general rule is that the flatter the land around your station, the less gain required.

This is quite at odds with the philosophy or radio antenna and life in general which decrees that "bigger is better", especially when bigger costs more. How can a less expensive antenna, a smaller one with less gain, be better?

As we discussed with mobile whips, when dealing with omni-directional aerials the lower gain antenna sends more "flat" signal than "high" signal. If you are atop a mountain with the world at your feet, that super-duper 12 dB stick is going to sling your signal even higher into the air instead of directing it down to the rest of your on-air comrades. A lower gain aerial, 3 dB or even a unity-gain whip, would get the signal down there where it belongs.

This is the sort of situation I'm in, with a house in Sydney's Blue Mountains and line of sight across the city and surrounds. For UHF CB I use nothing more than a discone, a zilch-gain antenna that receives the main VHF/UHF scanning bands and can also transmit on UHF CB

and the 2 metre and 70 cm ham bands. A high-gain whip would send my signals racing across the heads of all nearby folk, and that's not at all what I want.

In the earlier days of UHF CB and 477 MHz repeaters there were quite a few repeaters which had a virtual "shadow" extending for kilometres around their antenna - especially annoying when the repeater was located atop some high building in the centre of town.

You guessed it - the people who established the repeater had gone for the biggest and most powerful base antenna they could find, with the result that a substantial number of their uses couldn't even work through the station unless they drove to the edge of town.

## Yagi Antennas

Directional "beam" antennas come into their own when you need that little extra boost of range, either to work through a repeater or stretch your simplex talk-distance. Beam antenna effectively harness the limited output of UHF CB stations and also cut down on interference from other stations which may be on the same channel although not along a direct path between the two stations.

## Co-Axial cable For UHF

Cable is your radio's lifeline through which the RF flows. Think of how blood courses through arteries and veins, adapt the picture to RF and co-ax, and you can see why co-axial cable is often thought of as the most important part of any installation.

There are four common cable specifications, each of 50 ohm impedance, and their loss figures are rated on a 30 metre run.

The thinnest cable, and the one most suitable for mobile installations, is RG-58U or the superior RG-58C/U. RG-58 has a loss of 13.5 dB over 30 metres at UHF CB frequencies, so even over a 15 metre run there's very little of the original 5 watt signal being fired from the antenna.

The use of a linear amplifier is no real solution to this.

The linear will boost your rig's output power to compensate for cable loss, however this loss works both ways, on receive as well as transmit. So a small signal received at the antenna will be easily halved in strength by the time it gets to your UHF rig, and unless you have a linear with a built-in receive pre-amp there is no way to recover this lost audio... you can't boost what isn't there!

RG-213 cable is most commonly used for base stations and represents an improvement of massive proportions over the RG-58 family. It has a loss factor of only 5 dB over 30 metres, although after adding a few in-line connectors and allowing for some real world tolerance an effective figure of some 6 dB is more likely.

A cable run of around 15 metres is not uncommon on UHF CB, especially when operators erect tall masts to maximise antenna height and therefore coverage. This would halve the loss to around 3 dB which in the logarithmic world of RF represents a halving of power, so 5 watts out of the rig becomes 2.5 watts out of the stick. A shocking truth to confront, but when the better part of the cable run is vertical (up the antenna mast) the benefit of added height will compensate for the cable loss.

The most efficient cable for UHF in terms of cost vs loss would be 10DF-B, which only drops 2.4 dB per 30 metres, half again that of RG-213.

In all instances, keep the cable run as short as practically possible. Always leave some extra in case you decide to move the rig or the antenna around, but don't go overboard. And if you do have metres of extra cable in the run, never "loop" or coil the spare cable.

And remember that the rule-of-thumb for UHF transmission is "line of sight". The height of the base aerial is directly responsible for your performance of your station.

## Connectors

Plugs and connectors are often the weakest link in the chain. Picture this - an operator spends around $500 on a UHF CB and power supply, another $100 on a base antenna, $30 on a 10 metre run of RG-213, and then scrimps on the connectors, buying them for as little as possible. Cheap connectors are the one thing you can't afford.

There are three common connectors for UHF CB - BNC (used for handhelds), PAL (seen on the Philips FM-320, FM-620 and FM-640 mobiles, and why this is beats me!), and the old favorite PL-259.

If there's any such thing as a "standard" UHF CB connector, the PL-259 is it. Irrespective of it's higher loss and poorer quality than the BNC, N-type or similar commercial-grade fittings, the PL-259 is found on almost all mobile rigs and thus almost all de facto base stations.

Good news, you think - you've got a couple of spare 259's from that old 40 channel you had in the mobile, so there's a few dollars saved.

Not so, for not all PL-259's are equal. Those which cost very little but will do the job at 27 MHz are definitely not up to the requirements of the ultra-high frequencies.

Make sure that you ask for and get PL-259s suitable for UHF.

**Got a rig? Got the right antenna for the job, some good quality cable and connectors? Then get to it, and I 'll catch you on air!**


ABCDE
FGHIJK
L NO
PQR T
UVWX
YZ

Ignore it and it won't go away.

MS

Multiple Sclerosis.

# dx international

DX - UP, DOWN and AROUND 11 METRES ...*with Jack Haden*

**The absence of any real good DX on the 11 metre band has left me to ponder as to whether I should rename this column "No news is good news", for this edition anyway!**

**The 11 metre band has been in appalling shape over the past few weeks with little or mostly nothing in the department of rare or even semi-rare DX around to gloat about.**

However, on odd occasions all is not lost, as there is often a fair to reasonable path open from Australia to the U.S.A. and the Central Northern Pacific region. In reality all this does is keep a small degree of sanity in the shack and stops one from going around the proverbial twist from listening to too much static crackling through the radio speaker.

Unless you have a regular contact into the States, or are chasing the Worked All States award, there is very little incentive to switch the radio on at all during daylight hours.

Then again, there is always the dill down the road who magically acquires an American accent as soon as the band is open to the States and he will no doubt keep you entertained for a few minutes with his constant drivel.

The band doesn't seem to be bursting with activity at night either. Gone are the pre-sunset openings into Africa and the Middle East. Even the big mouths from Western Europe are conspicuous by their absence, not that they are missed by many in this part of the world.

Actually it is quite refreshing to listen on the call frequencies without some dick head whistling or yelling "Oooolaaah, Oooolaaah". The Europeans have a bad habit of doing that, slap band on the call frequencies...seems they enjoy having an audience...

However, don't kid yourself that the dill down the road has put his radio away because "Stateside" has faded out - he may surprise you.

When you least expect it he will emerge yelling the ever dreaded and despised by many "QSK...QSK...QSK..." at the first station he hears. I sit back and think, for God's sake don't anyone whistle, please!!

Sure enough, some idiot will whistle before calling and the dill down the road will then copy it.

Like the Big Guns from Western Europe, the brain dead too are quite conspicuous by their absence on the usual call frequencies above channel 40, especially now there is little or no DX.

The odd one or two will make a brief appearance, usually because activity on channel 35 has dropped off to nothing. In this case the old proverb prevails...idle hands create mischief.

So they sneak above 40 to see what DX is about or, in their limited vocabulary, they have come up to "shoot some skip", with power mikes and other add-on garbage fully "wound up" and ready for "action". Usually they shout, or whistle, or sometimes just go "Oooooolaaah....Oooooolaaah" a few times, paying homage to their European idols I suppose, before they eventually get their DX call out.

**With 11m DX fast vanishing into the distance, Jack Haden gets a few things off his chest about the '10' code and the proper use of the 'Q' code and then becomes nostalgic.**

**ever heard of a Kraco... how about a Swamper or maybe a Tram Diamond Base ? If you haven't - read on!**

In Sydney we are blessed with one particular breed of ethnic brain dead who must, before placing his DX call, whistle a few bars of the Portuguese national anthem.

It tends to wear a little thin second or third time around. One DXer was heard to ask his address so that he could call in and "shove his microphone somewhere where he cannot whistle into it".

Takes all kinds on 27MHz.

## TIMES DO CHANGE

Since its conception and subsequent legalisation back in the late seventies, CB radio has changed dramatically here in Australia. Some of the changes have been for the better and others for the worse. It all depends I suppose on which way you prefer to look at all the changes... How many of us can remember back to the channel fiasco?

At first we had 23 channels based on the American system, then we went to a revised "Australian" 18 channel system which nobody liked and this was eventually changed back to the American based system - but this time with the added bonus of an extra 17 channels to give us 40 channels in all.

I suppose one could say that back then the much despised (by those who possessed some degree of common sense) "10-code" cemented its place into CB radio terminology. The only thing the wretched 10 code really proved was that your average Aussie wasn't too bright in the originality department to the point of communicating normally on a radio system without using stupid jargon and "codes" imported from the U.S.A.

Look at it this way, do you pick up the telephone and say 10-9 when you cannot hear the person at the other end or do you say on the phone "that's a big 10-4" when you agree with the other parties comments?

Of course you don't, then why use it on radio?

At least today we don't have near as many drongos on the call channels asking for the 10-36 as we did a few years back!

However, although the old 10 code may have been, to certain extents jettisoned, it does rear its ugly little head on the radio from time to time, usually by way of resident call channel stirrers after a "bite" from dormant alligators who congregate anywhere there is a potential audience ie: the call channels.

## ARE CHANGES FOR THE BETTER?

Well, here we are, nearly knocking on the year 1993's door and not a great deal has changed for CB radio over the past few years.

We are still "lodged" on the 40 channel system on 27MHz...

The congestion on these channels, especially in cities like Sydney and Melbourne, has to be heard to be believed

and, from what mates tell me, the 40 channel UHF band isn't much better either.

The only real change that I notice in the past few years is the amount of anti-social behavior that seems to be increasing as each year passes.

Resident drongoes, dills and and other associated wackers seem to dominate the AM portion of the 27MHz 40 channels and, to a certain extent, also parts of the SSB allocation.

These "people" (you call them what you will) cannot say one complete sentence with "flavoring" it with at least one four letter word. From what I can gather by listening in to these misfits of society most of them fall into the 13 to 25 year age group and don't have much in the way of a positive outlook on life or possess any self esteem or pride in themselves.

Some people say things never change and life is like an old motor car. To breathe fresh life into it you give it another paint job and change the number plates - the exterior looks different but interior wise things remain little changed.

CB radio is a little like this in some ways.

A paint job here and a different set of license plates there, it all depends on how you look at things.

The hearty and often ridiculed "10-code" has made a slow exit from the CB radio scene and candidly,it will not be missed.

However, it too has just born witness to a "spray job and another set of number plates" phase in life.

The old 10-4 may be fading away but it has been largely replaced by some another poor attempt to master the English language by the brain dead element. No doubt at one time or another we have all "met" the "Roger" family and his sons who we hear quite often on the radio. There's "Roger Dee" and his brother "Rod Jer" and to a lesser extent the half brother of the pair, the misfit "Roger Dodger". The latter often appears just to remind us all that he too is still around.

Then again I suppose it is better than hearing that American drivel, "10-4 Good Buddy" etc.

As with any dying species, there is always a survivor and in the case of CB radio it would have to be our old "breaker breaker friend" who can still be heard all over the bad today.

Yes, good old breaker breaker is still hanging in there.

However, some elitists who inhabit the "out-of-band" section of the spectrum have changed the proverbial menu to suit their own palates. Poor old "breaker breaker" has been dropped in favor of the more "upmarket" and supposedly more polite "QSK".

There is nothing worse than having a chat on a frequency and have some dork start yelling "QSK, QSK, QSK" at you between overs.

I can tolerate the occasional "breaker" spoken once only and not in repetition but a barrage of "QSKs" is definitely not on with me and I know the feeling is the same with a lot of the older DXers.

## THE "Q" CODE DEBACLE

While the ridiculous 10 code slowly fades into the sunset, it has been replaced to a certain extent by the abuse of the "Q" code.

The brain dead and other dills just love to use the "Q" code on voice transmissions. It is obvious that their vocabulary is so limited that they have to use the "Q" code in order to place a call or hold any conversation while on air.

The "Q" code was originally devised for CW (Morse Code) operators as a maens of abbreviating commonly used texts, questions and answers in order to shorten the transmission and speed things up a little.

The "Q" code is still used extensively on the CW modes today, but the unfortunate part of the story is that it has now crept into the voice modes of transmission.

One of the first, if not the first "Q" code to creep into voice communications would have to be "QSL". For those unaware of what QSL means, it is, in question form "Do you acknowledge receipt?". In a reply it would revert to "I do/do not acknowledge receipt".

This is of course designed to abbreviate and ease things a little in the CW (morse code) mode of transmission, after all that was the purpose of the "Q" code in the first place.

QSL has today more or less gained acceptance in voice transmissions,not only on CB radio but also on amateur radio. A close cousin to QSL, "QRZ", also receives a bit of a hammering these days on the voice transmission modes.

The brain dead and the semi-brain dead on 11 metres love dear QRZ. You hear him mentioned quite regularly.

Going back to the workings of CW, "QRZ" is interpreted as meaning, in question form "Who is calling me?" and from time to time reverts to "You are being called by.....".

Like QSL, our new "friend" QRZ is also gradually gaining acceptance as part of the jargon on voice communications on both CB and amateur bands.

## STRANGE THINGS ARE HAPPENING

Strange things happen on 11 metres.

One of the strangest I have noted in recent times concerns our just mentioned friend "QRZ". It appears some of the brain dead "Q" code jockeys have readjusted the meaning of QRZ to suit their own stupid antics. They, in their "wisdom", have changed the meaning of QRZ to mean "callsign" and nothing else in between.

I heard one dill a couple of weeks back say to another station "what is your QRZ?"

The other guy asked him what he meant!!

Just a few nights back I heard two DXers talking and one mentioned to the other not to put the "QRZ" of so and so on the envelope...his mate asked what the hell he was talking about!!

I nearly fell off my chair laughing.

I have also noticed that the Alfa Tango mob go in for using QRZ to mean call sign judging by the last few lots of their propaganda that has arrived on my desk.

A callsign is a bloody callsign!

How in hell it can become a QRZ is beyond me. The word CALLSIGN is well known in English on voice transmissions right around the world, so where does this QRZ crap come in? Our two friends QSL and QRZ are not alone being closely followed by QSY, QTH, QRM, QRN, QSG, QRT, QSX, QRX and the nauseating QSK which seems to be the choice of the brain dead operating out of band these days.

QSK, QSK, QSK being shrieked at you is enough to put any one off radio for good.

I heard one of the local flips calling last night for DX. He ended his call with "we are QRT, QSX and QSY to 27 point blah blah blah upper sideband, QRT, QSY, we're gone". I just shook my head, could you imagine this guy picking up his telephone?

He would probably say "QRZ ?.....QRZ?"

Or he is down at the club with his mates (if he has any that is) and announces that everyone QRX a moment whilst he QSY's to the toilet. They would think he was a proper twit if they didn't think so already. Why use "Q" codes on the radio unnecessarily?

You don't use them on the telephone or in face to face conversation, so why worry about them on the radio to the extent that some do?

## EQUIPMENT CHANGES

Remember the sturdy old CB rigs of yesterday?

They didn't have as much plastic on them in those days but they didn't have a beaut digital readout either.

Remember that ugly channel recess on the Johnson Viking mobile set?

Sort of looked like a silly American Halloween pumpkin cut out gone wrong, although I was told by many that the rig used to work extremely well.

*(continued over page...)*

# dx international

continued from previous page...

Can you remember when Pearce Simpson gear was made in the U.S.A. and was quite popular because of the sturdy construction and the attractive wood grain front panels they used to go in for..?

The most sought after set those days would have to be a Cobra.

The Cobra base was the favorite of many DXer in those days and I often heard heated discussions as to whether the Bengal base was better than the Cobra base and vice versa. Hy-Gain sets were also in abundance along with the Midland sets which were also very popular.

Catering for the home base operator of DXer was the Kraco base and the flash looking President Washington series. The mobile sets were just as flash too. Getting back to the Kraco, people used to swear by them too (and at 'em also..Ed) in those days, best base station set for DX I was told time and time again.

I can still remember back when people used to argue that the Pearce Simpson Super Panther with the green digital display was a better set than its brother with the red digital display. I never stuck around to find out who was right and who was wrong.

A set that never really took off was the Communications Power Incorporated (CPI) series of CB radios which was a surprise as the base rig was quite a marvel and performed very well...at least that's what I was told by the privileged few who had one. The only thing that kept them back was the price, in those days they weren't cheap.

If you could afford the base rig, I was told you could tinker about inside of it and really get the thing going, also it was a good mod job for some "steps" and extra channels I believe.

In "the good old days" 27.145 was a DX calling frequency, don't hear as much as a carrier there any more.

Microphones haven't changed a great deal since the old days with Leson, Turner, etc still with us and these products still look much as they did back in the 70s.

Most of them still sound as horrible as they did back then too because operators invariably overdrive them. I remember a kid who run a Tram Diamond Base with a Turner Super Side Kick about 14 years or so back, he was about 3 channels wide on the band even though he was a suburb away. I wonder if the old Piezo base mikes are still about? I heard some conflicting reports on their performance, a case of either you loved them or hated them.


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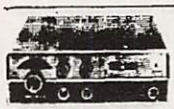

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CB ACTION No. 4 — 27


***There were a lot more rigs to choose from in the 'good old days'.***

Antennas have changed a bit since the "old days" and I wonder who can still remember that strange looking Dick Smith Swamper (sorry Chris) base vertical antenna with the silly looking hoop on the top that threatened to drag the whole thing over?

It worked well but really did look weird.

I had a mate who used to run one of those things and boy, was he the butt of some comments and jokes. In the end the poor bugger took it down and ended up running a dipole!

One particular antenna I found to be a great success for DXing was the Archer five eighth groundplane.

It was a three radial job and I used to work anything I could hear on it back in the 70's. The only draw back was that in the city it tended to drag in too much noise along with the signal, but, in the country

it was a real goer. I still see the odd one or two lashed to the occasional chimney here in Sydney even though they don't make them anymore. I had mine stuck on top of the clothes line in those days as the RI's were knocking people off for working on 27.145 etc.

Well I suppose the old Ringo should rate a mention.No doubt about it, they sold a lot of Ringo's over the years but I found most of them to be rather pathetic in the DX arena being a little on the "deaf" side.

Groundplanes were all the go for the DXers then with various sizes and shapes coming onto the market - anyone remember the Astro brand?

Not too bad on the DX as long as you got the thing up as high as you could and clear of ANY obstruction nearby.

Although beams and quads were about, both commercially and of the home brew variety, most were to be found in the rural areas of the country.

Not too many in the mid to late 70's were to be found operating directional antennas in the suburbs of our large cities.

Perhaps the RI's had something to do with it or maybe some just hadn't bought the idea that a beam or a quad works far better for DXing than any omni-directional antenna.

Many an evening was spent in the "old days" arguing about the merits of quad versus beam, groundplanes versus ringo type etc.

When the New Zealand DX came in we all used to "attack" the strongest signal we could find from across the Tasman and all front up for signal reports.

Later that night the reports given by the Kiwi station would be volleyed about in the ongoing quad versus beam saga. Height was a factor, nearby obstructions (even to the extent of "cloud cover") affecting the signal (sorry Cliff) was jostled about in debate, not to mention coax brand, gauge and run etc.

## GREATER MOBILITY, FREQUENCY WISE

I am sorry to say I don't have many fond memories of the days of the plug in crystal as they were the proverbial pain in the bottom.

Then came along the blessed PLL circuitry and the ease that one could "knock out" a few extra channels was a boon. The extras were limited but were better than nothing and at least one could escape from the brain-dead down on the standard 23 or 40 channel allocation.

Even though a lot of us had some "extras", at night we all would come home to roost on 27.145 and exchange notes.

I remember a mate of mine in Newcastle converted a Ferris base station to operate from 26MHz through to 28MHz by using the binary system, Trevor was quite proud of his creation. However, a mate of mine who had one of these rigs kept loosing the sheet of paper needed to work the large number of toggle switches mounted on the top of the cabinet.

In the end he linked a frequency counter up to the set on a more or less permanent basis to find out where he was. (Hey, do you also remember the voice which would come up and enquire from anyone as to what frequency they were on..?..Ed)

Noise blanker switches etc., were tinkered with to give us some "extras", pots were "trimmed" to the extreme to give that much needed 5 to 10KHz slide to escape the Good Buddies and other drongoes, etc. Switches were added here or rewired there and this went on for many years and certainly still does today.

A blessing to many was the arrival of the Redco Digiscan. Now this u-beaut device expanded the frequency range of the majority of "good" transceivers from anywhere to almost anaywhere else.

The premium drawcard was the digital readout of the exact frequency you were on and they must have sold hundreds of these gadgets. The New Zealanders knew that they were about due to the rapid increase of Australian stations appearing on their then 26MHz AM only service.

With the appearance of the Digiscans the old group on 27.145 and 27.045 gradually dispersed and new meeting frequencies were found and occupied.

Some of us even went on to amateur radio as the magic was loosing its lustre as time progressed and more people came on to CB radio.

Amateur radio transceivers were around 27MHz from the start too, after all, the band belonged to the radio amateurs well before CB radio "took over".

Even today amateur radio transceivers are still about which run 11 metres, although in those early days the crystal cutters made quite a few bob out of the trimming and cutting of crystals for 26 and 27MHz. So too did the tube manufacturers as CBers came into possession of value run amateur gear and then proceeded to, mostly through lack of knowledge and patience, blow up the final tubes.

One good thing about the old valve rigs was that you could run good power even with a reasonably high Standing Wave Ratio, not so today with the solid state transceivers.

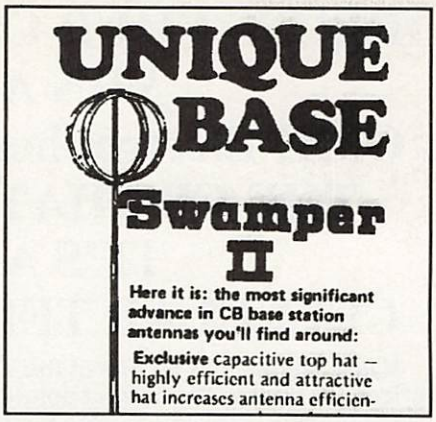
One whiff of an above normal SWR and the rig either cuts the power back automatically or in the case of an older solid state rig the power transistors go "bang".

Auto antenna tuners can only do so much, most will only adjust an SWR discrepancy up to or around 3:1 ratio, anything above that places too much strain and load on the mechanism and ends up usually burning the ATU motor out.

I always find the old manual ly operated ATUs the best if you want to fiddle with SWR levels.

Well, I hope you enjoyed the trip down memory lane with me, a good way to fill in some pages whilst the DX is down and give us a chance to pause and reflect back on the so called good old days.

I hope to have the column back to normal next issue, band permitting that is.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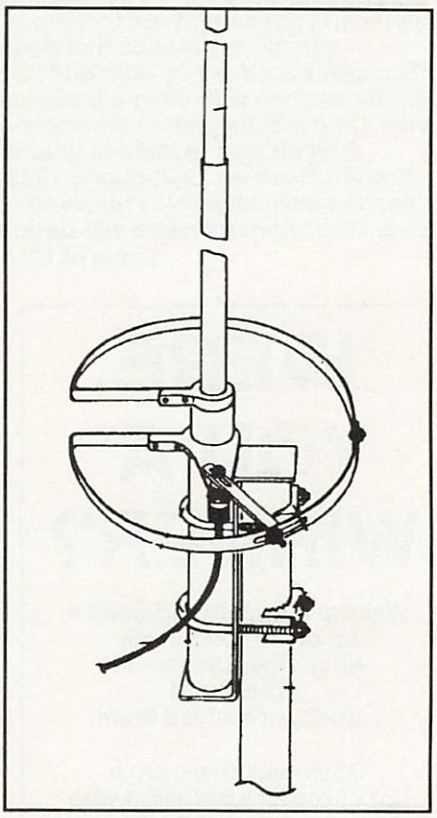
Here it is: the most significant advance in CB base station antennas you'll find around:
Exclusive capacitive top hat – highly efficient and attractive hat increases antenna efficien-

***Above: The Swamper 'top hat'. Below: The Ringo, and variations on a theme, were probably the most popular antenna during the 70s.***



# HERE'S YOUR CHANCE TO WIN A GME-Electrophone TX-850 - THE CB THAT THINKS IT'S A CELLULAR TELEPHONE

**If you missed out on one of the TX-4000 UHF rigs - the prizes for finding the correct solution to our November/December issue crosword - here's your chance to look like a real trendy with the just released GME-Electrophone TX-850, the CB that thinks it's a cellular telephone.**

**This brilliant little mobile rig received an excellent review from Ken Reynolds who says "this is far and away the best rig of its type we have encountered over the years.**

**If you decide to buy one of these flashy little units, at least you can't get caught out making bogus 'phone' calls on a plastic toy replica that doesn't even work".**

**The crossword is not even difficult and should be a 'shoe in' for anyone with even a basic knowledge of the CB service - and maybe just a little knowledge of radio in general.**

**Don't forget to include your name and address.**

**Entries close on 29 January, 1993 and the winner will be chosen from all entries received up to and including that date. The winner's name will be advised in the March/April issue of CBA.**

# WERE YOU A WINNER?

**Well we certainly expected a lot of entries for our November/December crossword ...and we received them!**

**Obviously there are a lot of readers out there who wanted one of the two GME-Electrophone TX-4000 UHF rigs, but, there can be only two winners and they are...**

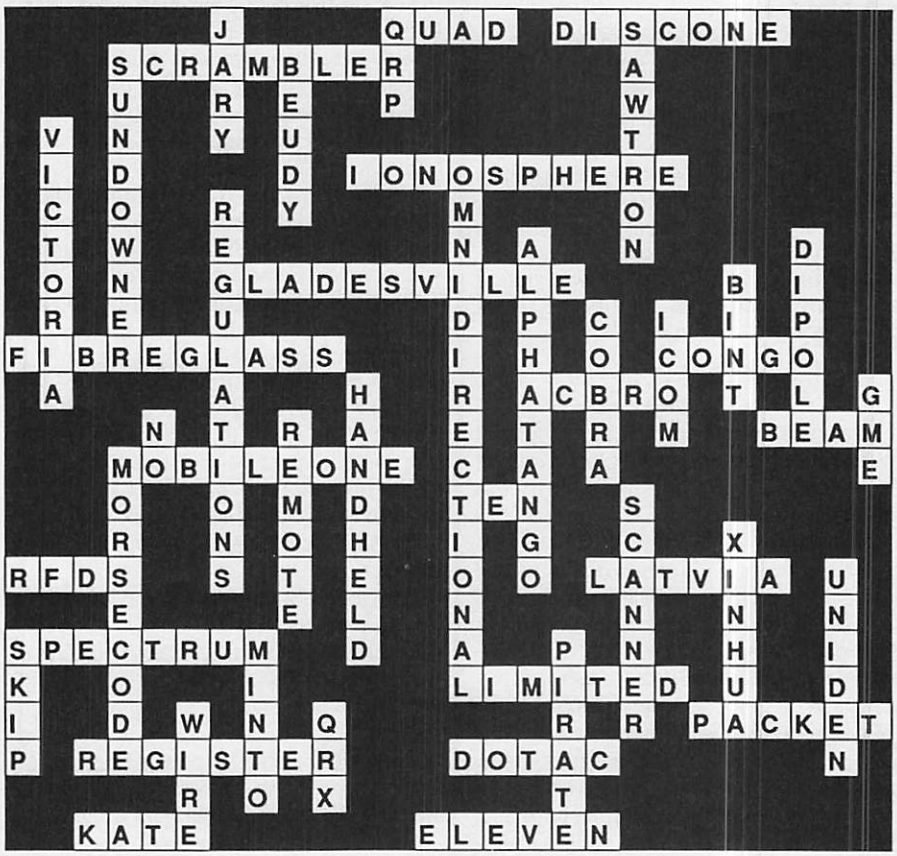
**Ms. Tara Stewart, Bond University, Gold Coast, Queensland.**

**and**

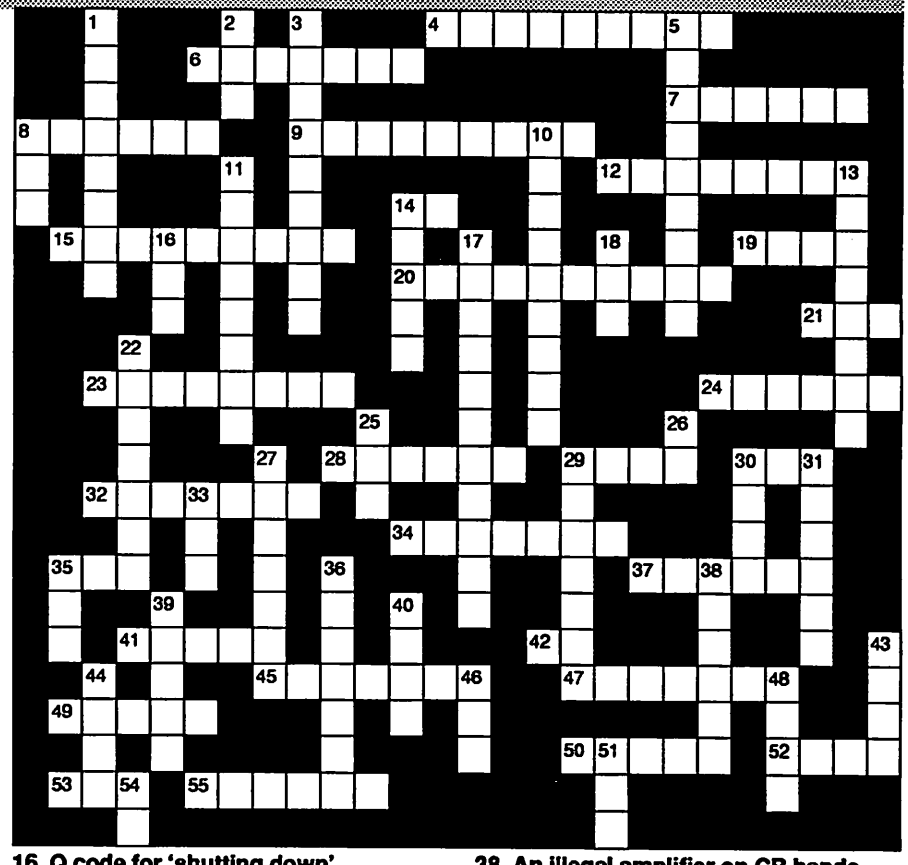
**Mr G.D. Polkinghorne, Port Augusta, South Australia.**

**Congratulations to you both. Your rigs will be delivered direct to your door within the next few days.**

## SOLUTION TO CBXW #4 - NOV/DEC



# WIN A GME-Electrophone TX-850 RIG



## CLUES ACROSS

4. AM stands for (word ?) Modulation.
6. What is the name of the company which produced the FM320?
7. If you're not operating from home you're probably operating ——.
8. What company makes the AX 144 transceiver?
9. Amateurs can bounce signals off one of these.
12. Ken (surname?) is a regular CBA contributor.
14. It's not USB and it's not LSB - it's the other one, much favored by children.
15. There are a lot of this sort of registers available for scanfans.
19. In reference to a vertical antenna - what's the first part of the word directional?
20. Greg Towell's column.
21. If this is higher than 3:1 you've got a problem (init).
23. The thing which makes UHF contact over longer distances possible.
24. A well known American antenna manufacturer (2,4).
28. A basic antenna.
29. A generic term for a directional antenna.
30. A type of coax cable connection.
32. The name of the company which makes the 999 UHF CB.
34. What does the C stand for..?
35. Bint Services specialise in these sorts of cards.
37. This will often cure a transmitting problem.
41. A CB rig named after a snake.
42. The suffix of Chris Edmondson's fullcall.
45. The thing you need from DoTaC before you can legally use a CB rig.
47. The first name of our scanner expert.
49. What's the surname of our regular HF DX contributor?
50. If you're lucky you'll have one of these for your antenna.
52. This is the acronym for the Amateur Certificate of Proficiency.
53. Another name for GMT.
55. A type of digital communication.

## CLUES DOWN

1. The name of the manufacturer who makes the MVT-8000 scanner.
2. The three letter abbreviation for megahertz.
3. An abbreviation for fleet satellite communications.
5. You should tune your rig into one of these.
8. The second CB service.
10. The Department of ——— and Communications.
11. TVI is sometimes caused by 'front end ———.
13. A 27MHz antenna made by Mobile One.
14. The SA based association of citizen band operators (init).
16. Q code for 'shutting down'.
17. A 'carrier' wave is this word.
18. The initials of our sister amateur radio publication.
22. The generally used term for selective calling.
25. A generic name used by this magazine which means transceiver.
26. The mode used on CB UHF (init).
27. A type of cable.
29. The word used to ask permission to join a QSO.
30. Policemen patrol one of these - it's also the first word of the acronym BFO.
31. This word can result from a change in frequency as a morse code key is operated.
33. Neighbours sometimes suffer this (init).
35. Three letters which signify where you're broadcasting from.
36. A type of antenna.
38. An illegal amplifier on CB bands.
39. We recently ran a story on this type of microphone.
40. The CB HF emergency channel.
43. A CBer's term for DX.
44. A —— meter is used to check transmission power.
46. The acronym for effective radiated power.
48. This is something done to a mobile antenna to shorten its physical length - trucks also carry one.
51. This is a unit of electrical resistence.
54. The common abbreviation for Morse code.

***The solution to this crossword will be published in the next issue.***

***Address your entry to:***
***CB XWORD, P.O. Box 628E, GPO, Melbourne 3001***
***NAME.....***
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***.....'PHONE.....***
***NOTE: Entries must be on this page - no photostats!***

# AUSTRALIAN UHF REPEATER LIST

***NOTE: Corrections and updates may be sent to: CBA Repeater Listing, PO Box E160, St James, NSW 2000.***

## ACT

| | |
|---|---|
| Canberra | 2/32 |
| Canberra | 8/38 |

## New South Wales

| | |
|---|---|
| Armidale | 4/34 |
| Barraba | 6/36 |
| Bathurst | 8/38 |
| Bega | 6/36 |
| Belbora | 1/31 |
| Binya | 3/33 |
| Blue Mountains | 2/32 |
| Bombala | 8/38 |
| Booral | 7/37 |
| Bowral | 6/38 |
| Braidwood | |
| Brewarrina | 1/31 |
| Brindabella Ranges | 7/37 |
| Broken Hill | 4/34 |
| Broken Hill | 7/37 |
| Buladelah | 7/37 |
| Casino | 6/38 |
| Cobar | 8/38 |
| Coffs Harbour | 6/36 |
| Coolah | 6/36 |
| Cooma | 4/34 |
| Coonabarabran | 4/34 |
| Corowa | 2/32 |
| Corowa | 5/35 |
| Corwa | 7/37 |
| Deepwater | 5/35 |
| Deniliquin | 1/31 |
| Dungog | 3/33 |
| Eden | 2/32 |
| Glen Innes | 7/37 |
| Grafton | 8/38 |
| Grenfell | 1/31 |
| Gundagai | 7/37 |
| Gunnedah | 2/32 |
| Guyra | 1/31 |
| Warden | 1/31 |
| Hampton | 1/31 |
| Hay | 4/34 |
| Inverell | 2/32 |
| Jindabyne | 1/31 |
| Junee | 5/35 |
| Kariong | 8/38 |
| Lavington | 4/34 |
| Manilla | 3/33 |
| Monkey Hill | 6/36 |
| Mt Lambie | 2/32 |
| Murrirundi | 3/33 |
| Muswellbrook | 4/34 |
| Narrabri | 2/32 |
| Narrandera | 8/38 |
| Narromine | 5/35 |
| Narromine | 6/36 |
| Newcastle | 1/31 |
| Newcastle | 2/32 |
| Newcastle | 5/35 |
| Newcastle | 6/36 |
| Nundle | 7/37 |
| Orange | 3/33 |
| Port Macquarie | 2/32 |
| Sydney | 5/35 |
| Sydney (south) | 1/31 |
| Sydney (west) | 3/33 |
| Sydney (outer-west) | 4/34 |
| Sydney (north) | 7/37 |
| Tamworth | 4/34 |
| Tenterfield | 3/33 |
| Tumbarumba | 3/33 |
| Tumut | 6/36 |
| Tweeds Heads | 4/34 |
| Wagga Wagga | 1/31 |
| Wagga Wagga | 5/35 |
| Walbundrie | 2/32 |
| Walcha | 2/32 |
| Walcha | 6/36 |
| Walcha | 8/38 |
| Warrumbungles | 1/31 |
| Wingham | 1/31 |
| Wilcannia | 1/31 |
| Wollongong | 8/38 |
| Northern Territory | |
| Bushy Park | 1/31 |
| Darwin | 1/31 |
| Erldunda Station | 3/33 |
| Katherine | 2/32 |
| Maryvale Station | 4/34 |
| Mt Swan | 2/32 |

## Queensland

| | |
|---|---|
| Alpha | 2/32 |
| Atherton | 8/38 |
| Amiens | 8/38 |
| Ayr | 3/33 |
| Barcaldine Downs | 1/31 |
| Bathurst Heads | 1/31 |
| Bauhina Downs | 4/34 |
| Biloela | 7/37 |
| Blackall | 8/38 |
| Blackwater | 6/36 |
| Brisbane | 1/31 |
| Brisbane | 5/35 |
| Brisbane | 7/37 |
| Bundaberg | 4/34 |
| Bundaberg | 7/37 |
| Cairns | 3/33 |
| Chinchilla | 8/38 |
| Clermont | 6/36 |
| Clermont | 7/37 |
| Crows Nest | 6/36 |
| Dimbulah | 6/36 |
| Dirranbandi | 8/38 |
| Double Island Point | 3/33 |
| Edward River | 3/33 |
| Emerald | 8/38 |
| Gladstone | 6/36 |
| Gold Coast | 3/33 |
| Goondiwindi | 4/34 |
| Gympie | 2/32 |
| Gympie | 5/35 |
| Gympie | 7/37 |
| Hervey Bay | 8/38 |
| Hughenden | 1/31 |
| Ingham | 2/32 |
| Inglewood | 1/31 |
| Innisfail | 1/31 |
| Ipswich | 4/34 |
| Jericho | 4/34 |
| Kilcoy | 3/33 |
| Lakeland Downs | 2/32 |
| Longreach | 3/33 |
| Mackay | 3/33 |
| Mackay | 6/36 |
| Marlborough | 2/32 |
| Maryborough | 6/36 |
| Maxwelton | 2/32 |
| Miles | 6/36 |
| Monto | 3/33 |
| Moranbah | 4/34 |
| Moura | 1/31 |
| Mt Isa | 1/31 |
| Mundubbera | 6/36 |
| Murgon | 7/37 |
| Quilpie | 2/32 |
| Rockhampton | 1/31 |
| Rockhampton | 4/34 |
| Roma | 1/31 |
| Springsure | 3/33 |
| Sunshine Coast | 6/36 |
| Sunshine Coast | 8/38 |
| Tambo | 6/36 |
| Taroom | 2/32 |
| Thargomindah | 6/36 |
| Toowoomba | 2/32 |
| Toowoomba | 4/34 |
| Townsville | 1/31 |
| Townsville | 4/34 |
| Wavell Heights | 2/32 |
| Warwick | 1/31 |
| Wide Bay | 1/31 |
| Yaraka | 7/37 |

## South Australia

| | |
|---|---|
| Adelaide | 5/35 |
| Angaston | 4/34 |
| Blinman | 3/33 |
| Carrietown | 1/31 |
| Ceduna | 1/31 |
| Clare | 7/37 |
| Cleve | 2/32 |
| Coonalpyn | 6/36 |
| Coppudurba Hill | 1/31 |
| Hawker | 7/37 |
| Kangaroo Island | 4/34 |
| Manum | 8/38 |
| Mt Bryan | 8/38 |
| Mt Gambier | 5/35 |
| Mt Gambier | 7/37 |
| Myponga | 2/32 |
| Naracoorte | 4/34 |
| Orroroo | 2/32 |
| Port Lincoln | 8/38 |
| Port Pirie | 4/34 |
| Renmark | 6/36 |
| Snowtown | 6/36 |
| Tarcoola | 6/36 |
| Wilkatana | 8/38 |
| Yorketown | 7/37 |

## Tasmania

| | |
|---|---|
| Burnie | 8/38 |
| Central Highlands | 7/37 |
| Devonport | 1/31 |
| East Coast | 6/36 |
| Flinders Island | 1/31 |
| Hobart | 1/31 |
| Hobart | 5/35 |
| Launceston | 2/32 |
| Launceston | 6/36 |
| Midlands | 4/34 |
| North East Coast | 3/33 |
| North West Coast | 4/34 |
| North West Coast | 6/36 |
| Sandfly | 2/32 |
| West Coast | 2/32 |

## Victoria

| | |
|---|---|
| Alexandra | 1/31 |
| Ballarat | 2/32 |
| Ballarat | 5/35 |
| Baimsdale | 7/37 |
| Beech Forest | 3/33 |
| Bendigo | 4/34 |
| Cavendish | 8/38 |
| Currajung | 4/34 |
| Echuca | 6/36 |
| Euroa | 3/33 |
| Falls Creek | 3/33 |
| Foster | 6/36 |
| Geelong | 4/34 |
| Halls Gap | 6/36 |
| Hamilton | 5/35 |
| Harcourt | 8/38 |
| Hawkesdale | 4/34 |
| Horsham | 3/33 |
| Kerang | 2/32 |
| Mansfield | 2/32 |
| Melbourne (north) | 1/31 |
| Melbourne (metro) | 3/33 |
| Melbourne (metro) | 5/35 |
| Melbourne (south) | 7/37 |
| Mildura | 3/33 |
| Moe | 2/32 |
| Mornington Pen. | 8/38 |
| Mortlake | 7/37 |
| Mt Cann | 8/38 |
| Mt Concord | 6/36 |
| Mt Delegate | 3/33 |
| Mt Terrible | 8/38 |
| Myrtleford | 8/38 |
| Penshurst | 1/31 |
| Shepparton | 7/37 |
| St Arnaud | 1/31 |
| Swifts Creek | 1/31 |
| Talangatta | 7/37 |
| Wangarrata | 6/36 |
| Waubra | 7/37 |

## West Australia

| | |
|---|---|
| Albany | 3/33 |
| Augusta | 7/37 |
| Bencubin | 2/32 |
| Boyup Brook | 4/34 |
| Bunbury | 2/32 |
| Carnamah | 2/32 |
| Carnarvon | 2/32 |
| Coolgardie | 7/37 |
| Darkin | 6/36 |
| Denmark | 1/31 |
| Esperance | 4/34 |
| Kalgoorlie | 2/32 |
| Kambalda | 1/31 |
| Katanning | 1/31 |
| Kellerberrin | 1/31 |
| Kulin | 4/34 |
| Lancelin | 4/34 |
| Mandurah | 7/37 |
| Manjimup | 6/36 |
| Margaret River | 6/36 |
| Meekatharra | 1/31 |
| Merredin | 2/32 |
| Mia Mia | 1/31 |
| Mt Manypeaks | 6/36 |
| Mt Barker | 5/35 |
| Mt Barrow | 7/37 |
| Mt Saddleback | 1/31 |
| Mt Solus | 4/34 |
| Nannup | 2/32 |
| Perth | 1/31 |
| Perth | 3/33 |
| Perth | 5/35 |
| Perth | 8/38 |
| Ravensthorpe | 8/38 |
| Stirling Ranges | 7/37 |
| Wickham | 1/31 |
| Wongan Hills | 8/38 |
| Wyalkatchem | 6/36 |
| York | 7/37 |

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# UF2020

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